

COAL AGE

Vol. 4

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No. 2

Did you ever hear of an accident something like this?—

A miner leaves his working face before shooting time, expecting his "buddy" to fire all of the shots. The "buddy" follows instructions, but unfortunately is so severely injured by a windy shot that he is not able to make his way out. After suffering all night he is discovered by the fireboss and eventually reaches the company hospital.

Of course you have. What's the remedy?

Install a gate house at the manway entrance, so arranged that every man must pass it going in and out of the mine, the gateman hands each employee a brass check as he goes in. These checks are kept on a board inside the gatehouse and in easy reach of the gateman. The men keep their brass checks through the day so that every blank space on the numbered check board indicates a man underground. On coming out of the mine each man must hand his brass check to the gateman, who hangs it on the board. Thus, when all the men are out, the board is filled. If there are blank numbers on the board it is known that men are still in the mine.

The gateman keeps two side records. One is a book showing the hour each man went in and came out; the other is a set of cards on which is shown the home address, occupation and working place of each employee. If at 6 p.m. the board shows Jack Thomas still inside without the mine foreman's permission,

a rescue party is sent to his working place, as indicated on the gateman's record card: In several instances where this system was employed the man was found seriously injured. In one case several men threatened by damp were reached just in time.

If the man cannot be found in the mine, the card shows where he lives and a messenger is sent there. It may be found that he got by the gatehouse without leaving his brass check; a suitable fine will jog his memory for the future.

The cost of operating such a checking plan is small. A competent gateman can be secured for \$50.00 per month, and the night watchman can do the night checking. The mine foreman can tell every afternoon when all of his men are safely out of the mine. In case of fire or explosion in one section of the workings, the location of every man in danger would be easily obtainable by means of telephone connection with the gatehouse, so that help could be furnished to those most in need.

Then, too, think of the value of the gatehouse records for timekeeping purposes. Generally speaking, this alone will nearly pay for the checking. Under this plan, also, it is impossible for a foreman to turn in a shift for a man not in the mine.

If you have never tried a checking system, *start one today*. If you have a better plan than the one outlined above, tell us about it.

Ash- and Coal-Handling Equipments

BY HENRY J. EDSALL

SYNOPSIS—The kind of equipment that should be installed in any power plant for the purpose of handling coal and ashes, is dependent upon the size of the plant and the service rendered. The various types of equipment are discussed in this article and the power plants for which they are adapted.

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In planning coal storage for a power-plant supply, there are quite a number of factors to be considered, among which are the following:

1. Daily coal consumption.
2. Kind of coal used.
3. How coal is received.
4. Regularity of coal supply.
5. Advantages in purchasing to be gained by storage facilities.
6. Amount of primary storage advisable.

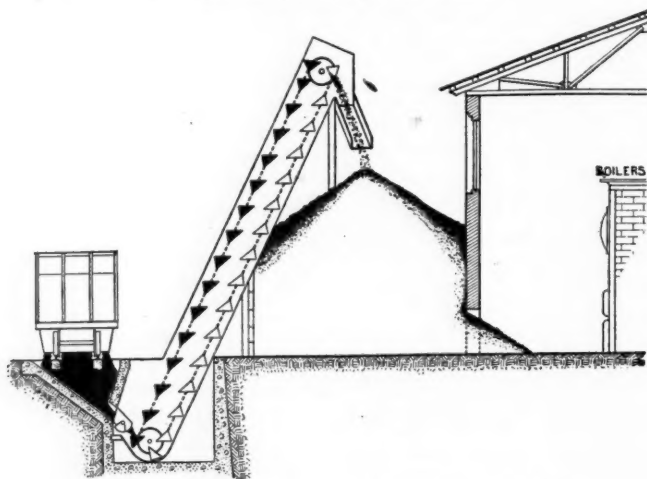


FIG. 1. BUCKET-ELEVATOR ARRANGEMENT FOR UNLOADING COAL CAR

7. Amount of secondary or reserve storage advisable.
8. Advisability of mechanical method of handling ashes.
9. Method of firing or feeding coal to furnaces.
10. Advisability of crushing coal, and to what extent.
11. Relation of railroad track or wharf to boiler room.
12. Space available for bins in boiler room, or adjacent thereto.
13. Space available for outside reserve storage.
14. Advisability of housing this reserve storage.

On the daily coal consumption depends largely the amount of investment justified. A large investment for handling a small amount per day is obviously not justifiable. For handling a large amount per day, however, there is frequently a choice of several possibilities, and the problem is to pick out the equipment which will give the best return on the investment with due consideration given to cost of labor, power, maintenance, depreciation and interest on the investment. In many cases there are other considerations of importance, such as the importance of a large storage as insurance against a shutdown, more favorable prices to be obtained by purchasing coal at cer-

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tain seasons, irregularity of winter supply, dependability of machinery versus dependability of the human element in keeping the plant going, additional efficiency to be obtained in boiler furnaces by proper crushing of coal and proper feeding to mechanical stokers and so on.

SMALL PLANTS

The small plant naturally comes in for first consideration. Where there are only one or two boilers of moderate size, one man can do the firing and wheel out the ashes. If the coal is placed within easy reach on the boiler-room floor, one man should be able to look after 400 or 500 rated horsepower of boilers. This will depend somewhat on the number of boilers which go to make up this total, as it is, of course, much easier for a fireman to handle one 500-hp. boiler of the three- or four-door type than two wide and low boilers of 250 hp. each. In any case a fireman should be able to handle 1500 to 2000 lb. of coal per hour. The coal supply for a boiler room

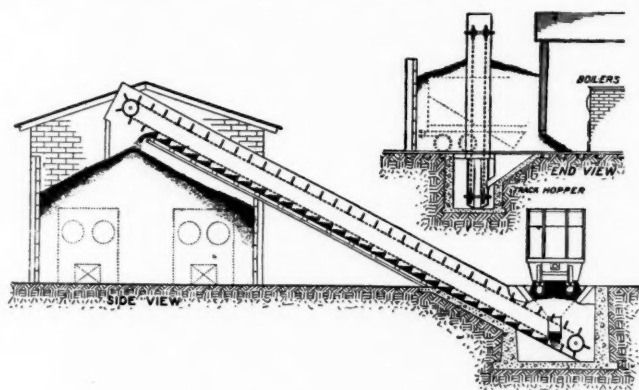


FIG. 2. ARRANGEMENT FOR UNLOADING BY A CONVEYOR

of this size is frequently brought in carts or wagons and dumped on the boiler-room floor. If the supply is regular, for instance, from a dealer with a good supply in his own yard, it is unlikely that any coal-handling equipment is justifiable. If, however, the coal is received by rail with a siding run in along the side of the boiler room there is the necessity of unloading the coal from the cars. Shoveling coal over the side of modern coal cars is expensive and almost always requires other labor than the boiler-room force. In such cases, therefore, it is usually justifiable to provide some method of unloading the cars as they are designed to be unloaded, that is, through the bottom doors. In most cases the first thought is to build a trestle or elevated siding for the cars, or to drop the boiler-room floor down below the ground level and make a vault for the coal under the track. Both of these methods are, as a rule, a mistake. A low trestle means distributing the coal along a considerable length so that the fireman has to go farther for it, and this outside wheeling of coal is especially objectionable in winter. If the trestle is built of wood, it means considerable expense in first cost, and a high maintenance cost with the increasing prices of lumber. If it is built of more permanent

materials, or built higher, it is still more expensive in first cost.

If the boiler-room floor is dropped below the ground level and vaults built, these are quite expensive for the amount of storage obtained, and there is still the necessity of considerable wheeling of coal. It also increases the difficulty of handling ashes as it is necessary to get them up out of the boiler room and either wheel them away or load them onto carts or cars.

USE OF CONVEYORS BEST

The simplest and best way, ordinarily, is to build a bulkhead or fence so as to form a coal bin just outside the boiler-room wall and use a simple chain and bucket elevator or flight conveyor to unload the cars and deliver the coal to the bin. By making doors or openings in the boiler-room wall, the coal can then be allowed to flow through to the floor in front of the boilers within easy reach of the firemen. The machinery for such an ele-

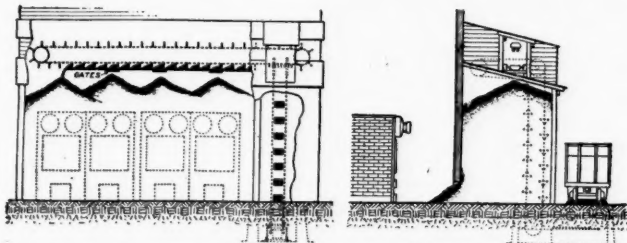


FIG. 3. BUCKET ELEVATOR AND HORIZONTAL CONVEYOR TO DISTRIBUTE COAL

the elevator and the cost of operating it would be about the same as the one described above, and a wagon loader equipped with a motor can be purchased for about \$700. They will load coal at the rate of about 60 tons per hour with one or two men to help the coal to the foot of the machine. Fig. 5 shows the possibility of using a wagon loader for unloading bottom-dump railroad cars and delivering to carts or industrial cars or to low bins or ground storage.

SIMPLE UNLOADING FROM BOATS

Where coal is unloaded from boats in small quantities, the simplest and cheapest rig is a mast and gaff with a single-drum hoist to handle a tub which is filled by dipping and shoveling. The tub delivers direct to ground storage or to an automatic or hand-pushed car on a small

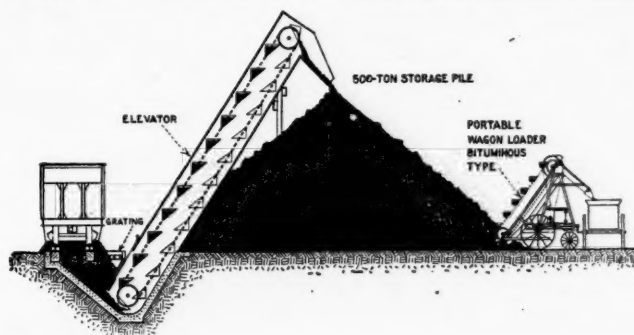


FIG. 4. RELOADING FROM GROUND STORAGE WITH WAGON LOADER

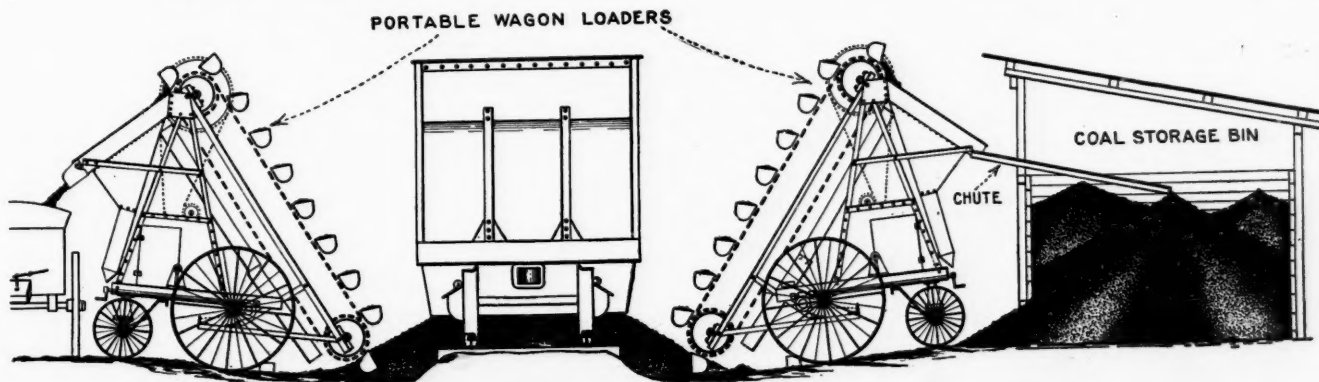


FIG. 5. USE OF WAGON LOADERS FOR STOCKING OR LOADING COAL

vator or conveyor will usually cost between \$500 and \$1000, depending on the length required and the size of buckets or flights, and the labor and power cost for unloading the coal from cars and delivering to a bin, will usually amount to less than two cents per ton. The maintenance cost for both the bin and machinery equipment is very low. Equipments of this type are illustrated in Figs. 1 and 2. Where it is desirable to make the bin longer for a longer row of boilers, it is best to use a chain and bucket elevator at one end, and a horizontal flight conveyor over the bin for distributing the coal lengthwise, as shown in Fig. 3.

Sometimes it is necessary to unload the coal from cars at a distance from the boiler room, or, perhaps, there are two or three boiler rooms that have to be supplied. Fig. 4 shows a simple chain and bucket elevator for unloading the cars and storing the coal on the ground, and a portable wagon loader for taking it from the ground storage and loading it into carts or small industrial cars. The cost of

railway for distribution over a greater area. Such an equipment is shown in Fig. 6. For picking this coal up from the ground a wagon loader will show a good saving if the quantity handled is not too small. For a boat-unloading equipment of somewhat larger capacity, a mast and gaff with a double-drum hoist operating a self-filling clam-shell buckets is frequently used, but for an outfit of this handling capacity, a locomotive crane is much more flexible and satisfactory for operating the clam-shell bucket. This is described later on.

As a boiler room increases in size, the amount of coal and ashes to be handled is increased, and either more men have to be used, or the facilities for handling have to be improved. When the amounts to be handled get to be too much for one man firing by hand, there is the possibility of reducing the labor by using mechanical stokers and feeding the coal to them automatically from an overhead bin. Besides the saving in labor there is the additional efficiency to be obtained by the use of mechani-

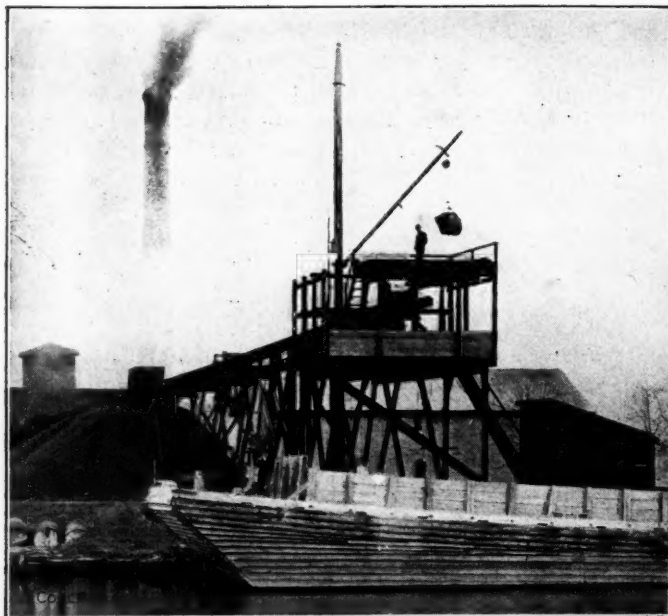


FIG. 6. UNLOADING COAL FROM BOATS WITH MAST AND GAFF



FIG. 7. UNLOADING BOATS WITH LOCOMOTIVE CRANE AND CLAMSHELL BUCKET

cal stokers. With such an arrangement one man is ordinarily able to look after about three times as much total horsepower of boilers as when firing by hand; that is, he could look after about 1200 or 1500 rated horsepower comfortably. This, of course, would depend on the number of boilers and the type of stokers, but one fireman should be able to handle from 4000 to even as high as 8000 lb. of coal per hour when it is delivered by gravity to the stoker hoppers. While some of the plants equipped in this way are comparatively small, there is more or less of a similarity between them, and they can, for purposes of description, all be classed as larger power plants.

LARGER POWER PLANTS

In figuring the saving to be obtained by reducing the number of men in a larger power plant, if we figure the cost of a man as \$12 per week, or \$624 per year, the saving of one man should justify the investment of at least \$3120, or five times the amount saved, that is, there should be a saving each year of 20 per cent. of the investment to pay for maintenance, depreciation and interest and a certain percentage in addition. There are usually other advantages to be gained besides these, such as a neat and ship-shape boiler room that tends toward higher efficiency, more contented men and less danger of strike trouble,

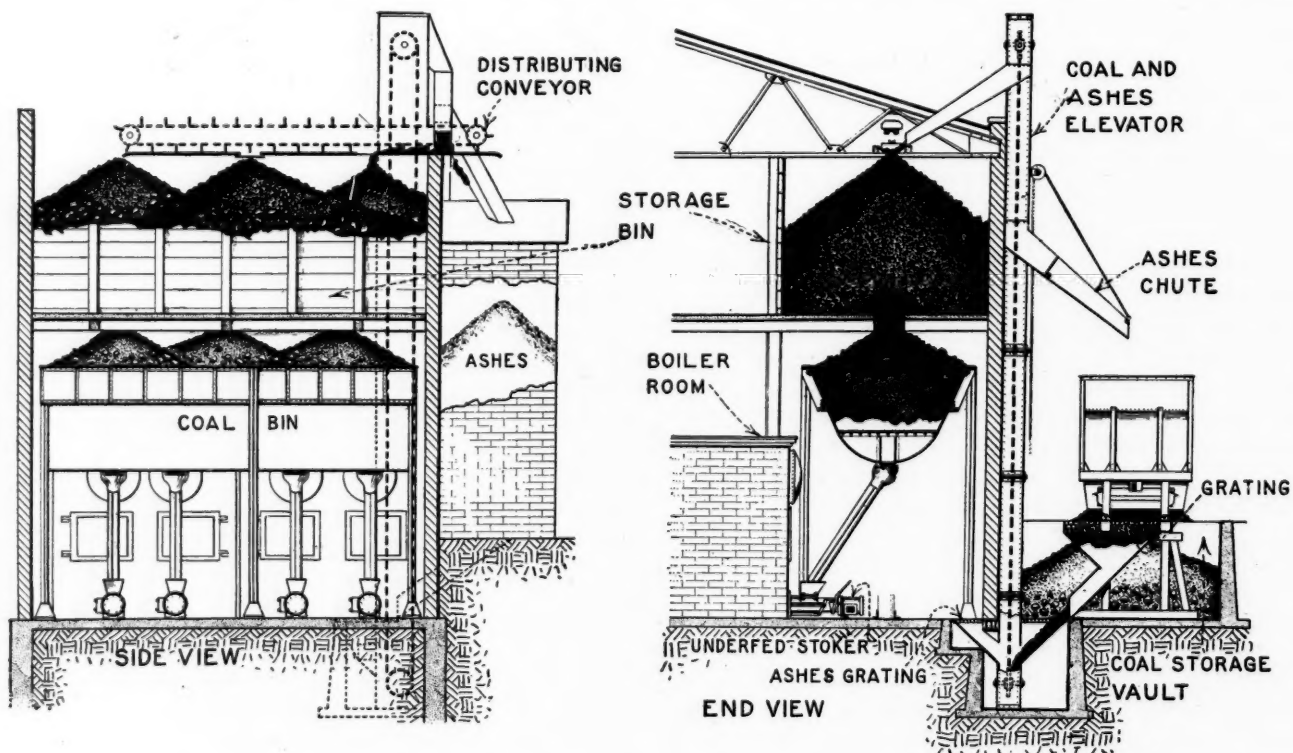


FIG. 8. THE SAME ELEVATOR HANDLING COAL AND ASHES

larger storage facilities, better efficiency from the furnaces, etc.

For overhead bin storage in a boiler room, a suspension type of steel bunker is usually the cheapest in first cost, and these will discharge a large portion of the coal without any manual labor and last for a long time. They can either be supported on columns resting on concrete piers, or if it is a new boiler room, the roof trusses can be designed with sufficient strength to carry the bin. Sometimes the bin is supported partly or entirely on the boiler-room walls, or on the boiler-room walls and walls around the boilers. In any case the bin must be placed high enough to give ample slope for the chutes to the stokers and not to interfere with cleaning or removing boiler tubes, and there must be room over the bin for the conveyor for filling it.

As with the bin outside the boiler-room wall, there is sometimes the possibility of using a single elevator of the chain and bucket type with divided spout for distributing the coal in the bin. Where the bin is very short, however, it is better to use a horizontal distributing conveyor placed high enough to fill the bin to maximum capacity, that is, with the coal piled up above the top and the sides of the bin at the natural slope for the kind of coal used.

ELEVATING TO OVERHEAD BINS

Fig. 8 shows an elevator and conveyor arrangement for handling coal, and in this case the same elevator handles the ashes. A steel Berquist bin was located in the boiler room with spouts to the stokers and, in order to increase the storage, an additional bin was built in a room directly above and openings cut in the floor to allow the coal to go through to the Berquist bin underneath. In place of building an elevated storage bin for ashes, the ashes are stored in a ground bin formed by four brick walls, and when it is desired to load them to a railroad car, they are fed back to the foot of the elevator, reelevated and delivered, by means of a chute, direct to the car. The ground storage bin is, of course, much cheaper to build than an elevated bin, and the reelevating adds only about $2\frac{1}{2}$ cents per ton for power and labor, to the ashes-handling cost. While with mechanical stokers it is usually necessary to crush the coal fairly small, in this case the crusher was omitted and a grating with $5\frac{3}{4} \times 6\frac{3}{4}$ -in. openings was placed over the track hopper so that any lumps too large to pass through the grating have to be broken by an attendant. This means some additional labor, but even with this handicap a large steel car of soft coal containing about 50 tons of run-of-mine soft coal can be unloaded in about $3\frac{1}{2}$ hr. with one man in the car and one man outside at the grating to break the large lumps.

There are two boilers in the boiler room aggregating a rated horsepower of 764. One day man and one night man look after the boilers, and have an easy job of it, and the boilers show a high efficiency.

(This article will be concluded next week.)

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The Coal Production of Utah

The production of coal in Utah in 1912 reached the record figure of 3,016,149 short tons, valued at \$5,046,451, an increase, according to E. W. Parker, of the U. S. Geological Survey, of 502,974 tons over the output for 1911. The known workable areas in this state aggregate more than 8,000,000 acres. The largest and, commer-

cially, the most important coal field is that of the great Uinta Basin, which lies parallel with and along the south side of the Uinta Mountains.

This field extends from Crested Butte, about one-third of the way across Colorado on the east to the western part of Carbon and Emery counties, Utah, on the west. This basin underlies large portions of Uinta, Wasatch and Carbon counties, its southern border being in Grand and Emery counties. The principal mining operations are carried on in Carbon County, more than 85 per cent. of the state's production coming from that locality.

Although by far the larger part of Utah's production is mined by hand, the efficiency record of the miners averages with the highest among the states. In 1912, the average production per man employed was 906 tons, while, in 1911, the average was 821 tons.

The reports to the U. S. Bureau of Mines show that there were 18 fatal accidents in the coal mines of Utah, in 1912, being four more than in 1911, but none of which were due to explosions of gas or dust.

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Virginia's Coal Production in 1912

According to figures compiled by E. W. Parker, of the U. S. Geological Survey, in coöperation with the Geological Survey of the state of Virginia, that state, in 1912, produced 7,846,683 short tons of coal, valued at \$7,518,576.

The figures given above are a gain over the preceding year of 981,971 tons in quantity, and \$1,263,772 in value. Over 75 per cent. of the total increase was made in Wise County, whose production, in 1912, amounted to 4,500,174 short tons; or a gain over the preceding year of 745,114 tons, equaling nearly 20 per cent.

The coal areas of Virginia, which have produced or now are producing coal, belong to the Atlantic Coast region and include the Richmond Basin and the Appalachian region. The latter comprises a number of separate areas extending across the western part of the state. The Richmond Basin is the only area of free-burning coal located immediately adjacent to the Atlantic seaboard. The first coal mined in the United States was from this area, mines having been opened and worked as early as 1750.

Virginia makes a somewhat unfavorable comparison with the other states of the Appalachian region in the quantity and percentage of coal shot off the solid. In 1912, of the total production of the state, 3,741,533 tons, or 47.7 per cent., was "mined" by the powder. This was an increase for the year of approximately 12 per cent. in coal so produced. On the other hand, the percentage of machine-mined coal increased from 27.2 per cent. to 40.85 per cent.

As the percentage of coal shot off the solid in Virginia is high, so is the death rate. In 1912, there were 75 fatal accidents, of which 67 were underground and eight on the surface. Thirty-three of the deaths inside the mines were due to falls of roof, 10 to explosions or burns of gas, 10 to premature blasts, or similar accidents, and nine to mine cars and locomotives.

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It is claimed as a result of British coal-dust experiments that the extent of an explosion will not necessarily be limited by keeping certain underground zones free from coaldust. The pioneer blast which precedes the actual flame of the explosion is sufficient to stir up enough coaldust to provide the necessary combustible material.

Prevention of Accidents in Coal Mines

BY JOHN McNEIL

SYNOPSIS—An abstract of a paper delivered at the second meeting of the Rocky Mountain Coal Mining Institute, in which the practice of blasting off the solid and legislation requiring payment on the run-of-mine basis is condemned.

As early as 1835 Great Britain appointed a Royal Commission of talented men possessing special knowledge in the conduct of coal mining, as well as eminent authorities in science, to examine into the subject of mine accidents. Since that time there has been a succession of such commissions at frequent intervals in all countries wherever coal has been mined. These commissions have applied themselves faithfully to the cause entrusted to their care, but, unhappily, there still remains a direful toll of mortalities and injuries.

The most prolific cause of accidents is from falls of roof and coal and, approximately, 50 per cent. of the fatalities are due to this cause alone. The greatest number of accidents occur at the working face, due to the neglect of the miners to stand props promptly upon the first evidence of bad roof. While the miner must necessarily be responsible, to a large degree, for the safety at the face of his working place, yet the mine superintendent and boss have direct supervision over him, and it is their especial duty to prevent carelessness, whenever cognizant of it.

In late years a large number of workmen, more or less inexperienced in mining, and unable to speak or understand the English language, have entered the mines, so that it is all the more essential that a vigilant watch be kept throughout the chambers and thorough discipline employed. It is not enough for the mine boss to tell the miner that his roof is poor and then to leave the place, but he must remain until the work he has ordered, has been done and obedience has been obtained.

Now I have been a pitboss myself and have not infrequently received notice from the superintendent that the cost of coal the month before was too high, and that a better showing for the present month would be expected. In turn, the superintendent would show me a letter he had received upon the subject from the general manager. So our anxieties in the matter were mutual, and faithful to our superior officer, we did our best to reduce the cost.

HARD TO WATCH THE MINER

Working under such high pressure, I had, as boss, but little time to keep a vigilant watch over Tom, Victor or Mike. My attention, under the circumstances, was more closely directed to the mule drivers, the cagers, the dumpers and the box-car loaders, so as to increase the output and lower the cost.

To have engaged an assistant for the purpose of watching the faces, would have seemingly increased the cost, but just that very thing should have been done. When I now read the mining laws demanding that the mining boss visit and examine carefully all working places daily, or every other day as the case may be, I know from ex-

perience the physical impossibility of his doing so in a very extensive coal mine, and yet there is the most urgent necessity of doing it.

I talk from experience when I say that probably in no other direction in the mining of coal can accidents be minimized more readily and completely than by keeping a vigilant and eternal watch on the miners in close proximity to the working face; and in the absence of the mine boss, there should be an experienced inspector clothed with authority to examine the roof, not only by ocular observation, but by sounding the top, in a careful and practical manner with a pick. His orders should be absolutely obeyed.

EXPLOSIVE CHARACTER OF DUST

The explosive character of coal dust is now universally acknowledged, and for many years systematic experiments have been carried on in Great Britain and other foreign countries, with the object of finding some means of preventing or mitigating the disastrous effects of colliery explosions.

During the past few years our Federal Government has made a searching inquiry into the causes of all recent mine explosions and established a testing station at Pittsburgh that is now under the supervision of the Bureau of Mines, and has published a number of bulletins of great interest on coal-dust experiments. Such research at home and abroad has shown conclusively that coal dust is a great source of danger, especially in the presence of firedamp.

TESTS AT EXPERIMENT STATION

Certain tests at the Station have shown that finely pulverized coal dust (200 mesh) caused an explosion where there was only 0.032 oz. of it suspended in each cubic foot of air, or 1 lb. in 500 cu.ft. of air. It has also been determined that to burn completely 0.12 oz. of such dust would take all the oxygen in a cubic foot of air, and the combustion of 1 lb. will take all the oxygen in 133 cu.ft. of air.

If a ray of sunshine could possibly penetrate the chambers of a dusty coal mine, we would be astonished to see the densely charged atmosphere around us, but in the gloom of the mine we are seemingly not cognizant of the latent dangers that lurk in the air. Custom makes one feel at ease. The surroundings are the same as they were yesterday; but in such an atmosphere, we are not safe if we tolerate heavy blastings with common black powder, or even permissible powder, for that matter, for all at times spread flame.

Whenever at such a mine I feel the vibration of a windy shot, I am grateful for my deliverance, and the more I see and learn, the more I feel that we often step on the very brink of disaster with frequent and heavy shot firing.

EXPLOSION IN A TIPPLE

In this connection I will relate a peculiar explosion which occurred on the 18th of October, 1897, at the tipple of a coal mine belonging to the Colorado Fuel & Iron Co., at Crested Butte, Colo., under the following conditions:

Note—Abstract of paper read before the Rocky Mountain Coal Mining Institute, Salt Lake City, Utah, June 12, 1913.

The mine entrance is situated on the side of a mountain and the coal is run to the tippie over a tramway about 1200 ft. long on a grade of from 5 to 20 per cent. In some manner a loaded trip of cars got over the "knuckle" without the rope being attached. The cars remained on the track and passed through the tippie shed at a fearful rate. The commotion of this passing body raised a dense cloud of coal dust in the shed and an explosion occurred simultaneously. Clouds of dense smoke and flame extended 35 ft. above the crown of the building and in a few moments the structure had taken fire in several places.

Two men employed in dumping the coal, seeing the runaway cars coming, made their escape, as they supposed, from flying timbers, but notwithstanding, both were severely burned and considerable damage was done to the building.

The only accountable source of the fire was from a stove in the weigh house. There were no inflammable materials stored in any part of the building, neither were the pit cars oiled there. The explosion, of course, was due entirely to coal dust ignited by the fire of the stove.

Happily, but few of our Western mines generate fire-damp, but those that do are all the more susceptible to an explosion, when coal dust is present in suspension in the air, or deposited on the roof, sides or floors so as to intensify the consequences greatly, should a gas explosion occur. In a number of our best regulated mines, there are water-sprinkling systems to moisten the coal dust and saturate the air. There are also other appliances that humidify currents of air upon entering the intake air course, such as radiators, steam injectors and mechanical water sprayers. Also some of us sprinkle adobe dust over the sides, roof and floor of the haulageways.

While we greatly appreciate the value of these admirable precautions, yet, if we, at the same time, permit heavy shooting and blasting coal off the solid with highly inflammable black powder, which is the most prolific cause of coal-mine explosions, it would appear very much as if we were straining at a gnat and swallowing a camel.

SEA SAND TAKEN INTO MINES

Upon visiting some very extensive coal mines in England some four years ago, I noticed great quantities of sea sand being taken into the mines, which was spread liberally over all permanent haulageways, almost giving them an appearance of stone when compared with our entries. As their cars, unlike most of ours, are of the closed-box doorless type, they do not strew coal dust along the haulage roads.

But in addition to all such precautions, Great Britain, unlike us, strikes at the root of the greatest evil by absolutely prohibiting shooting off the solid, and not only is the coal seam undermined, but sheared as well, and where wedges, plug and feather, hydraulic cartridges, or other devices can thrust down the coal, the use of explosives is eliminated entirely. When powder is resorted to in blasting coal, it is used in light charges, the machine and pick being used as much as possible, in order to bring down the explosive charge to a minimum.

It is estimated that a little over one-half pound of explosive is used on an average to each shot fired in

British mines, though the amount varies in different districts. In the Newcastle district, England, 4,508,290 lb. of explosives were used in firing 8,608,850 shots.

We have no data to draw a definite comparison with the Newcastle statements, but from experience and knowledge of the conditions, in this respect, throughout the coal mines of Utah, Wyoming, New Mexico and Colorado, I think you will all agree that our shots will average $1\frac{1}{2}$ lb. of explosives. Remember it is of average conditions I speak.

COMPARISON OF DEATH RATES

The British death rate in coal-mine fatalities per 1000 persons employed, ranges from 1.25 to 1.36 for a number of years. The fatal accident rate per 1000 employees in the United States, taken as an average from 1866 to 1908 is 3.10. The number of lives lost per 1000 employees in Utah, Wyoming, New Mexico and Colorado, taken on an average for a number of years, is 9.04.

We must frankly admit that the death rate has greatly increased in our mines during the last decade, but in the past 12 months, we have shown a marked improvement, and I know just how earnestly all of you are watching and working for a continuance of this good work. Now, as members of the Rocky Mountain Coal Mining Institute, I would recommend that we, as a body, exert our energy toward securing by law the abolishment of that dangerous practice of blasting coal from the solid; and let us demonstrate before our legislatures, by overwhelming evidence, that the enactment of the "run-of-mine" basis granted a license which may have been the cause of grave disasters. I am well aware that as the years go by, the prevailing custom of undermining and shearing the coal by pick mining is gradually but surely becoming a lost art in this Western country. The use of powder is so much less arduous for the miner in comparison to hand mining, and therefore the miners take a risk and strenuously oppose any change to either pick or machine mining.

To be successful in lessening the recurrence of disasters, we must install sufficient undermining and shearing machines to cut the coal and reduce the use of powder to a minimum; and the explosive that is used must be the safest product which we can obtain. Blasting operations being practically unavoidable in coal mining, we should, after reducing the shot charges to a minimum, adopt the best firing regulations practicable. The method of performing the blasting by shot firers with electrical appliances after all the workmen have left the mines, is a valuable precaution; but better still is the system of wiring the numerous shots in one circuit and firing the same by an electric current from the surface, when no one is in the mine, especially in those mines where fire-damp is given off. Accumulations of coal dust should be removed as much as possible from the vicinity of blasts and all shots should be tamped with incombustible material.

In this connection, I will quote from an article in the *Transactions of the Manchester Geological Society of England*, Vol. 18:

"This is an account of some experiments made in Germany in the Saar coal field in October, 1893. The gallery was constructed on the surface, 167 ft. in length, of elliptical cross-section ($5\frac{1}{2} \times 4\frac{1}{2}$ ft.) with a cross-gallery to represent the actual state of the colliery level.

One end was closed with masonry, in which cast-iron canons were placed, having bores the size of the holes generally used for blasting in the mines.

A SERIES OF EXPERIMENTS

Firedamp was conducted in pipes from a "blower" in the mine. The following experiments were made with one-half charges of powder:

First: tamped with clay, the length of the flame was nearly 10 ft.

Second: tamped with coal dust; the length of the flame was 26 ft. Neither firedamp nor coal dust were in the gallery during these experiments.

Third: tamped with clay; the gallery being strewn 131 ft. in length with nongaseous coal dust; the length of the flame was 18 ft.

Fourth: similar to No. 3, but tamped with coal dust; the length of the flame was 31 ft.

Fifth: tamped with clay; coal dust in No. 3 being replaced by the dust from Pluto colliery in Westphalia; length of the flame was 190 ft., with a heavy detonation and much afterdamp.

Sixth: a repetition of No. 5 without the addition of fresh dust, with almost identical results.

Seventh: tamped with clay; without coal dust and fired in air containing five per cent. firedamp; the flame was 36 ft.

Eighth: similar to No. 7 with 65½ ft. of the gallery strewn with coal dust from the Pluto colliery; the length of the flame was 170 ft., with very severe detonation and strong development of afterdamp."

Mine fires sometimes originate in a way that leaves no doubt as to the source of their origin, but a mystery remains as to how they became ignited. Therefore, precautions should be taken to minimize them as far as possible. Lumber cabins, seats, cupboards and boxes should be done away. Underground stables should be made fireproof, and only incandescent lights should be used in them. All cotton waste and other oily substances should be put in an iron keg reserved for that purpose and should be removed frequently from the mines. Overcast air-bridges and all permanent stoppings should be constructed of concrete or other fireproof material. Manways for the miners to travel to and fro from their working places should be maintained and men should be kept off the branch and main haulageways as far as is possible, in order to lessen the risk of accidents by mine cars.

INJURIOUS EFFECT OF BAD AIR

We have recorded the prominent causes of accidents, but we have yet to record the injurious effect on the general health of coal miners, caused by breathing stagnant or impure air, vitiated by powder smoke, finely ground coal dust and the presence of carbonic acid gas, better known as blackdamp. C. E. Foster, a late British inspector of mines, makes the statement "that there are quite as many miners killed prematurely from breathing impure air and carbonic acid gas, as there are from inflammable gas.

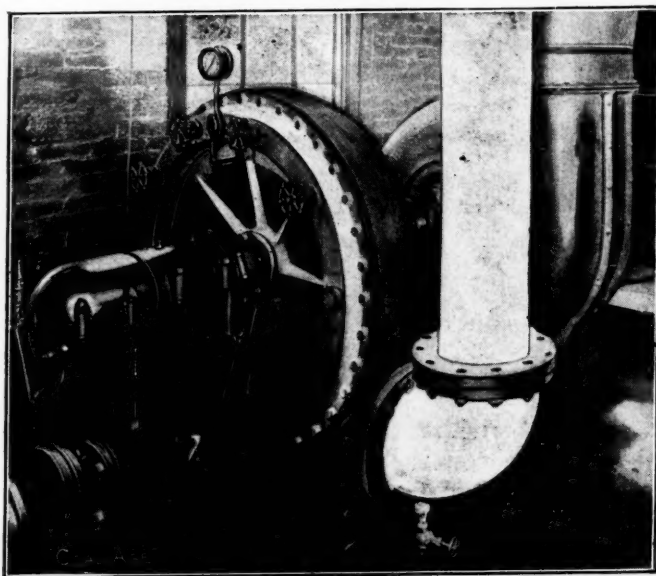
Therefore, a large ventilating current at the intake and the outlet of a mine is a good thing, but the ventilation will be bad, nevertheless, if the air currents are not continuously distributed and carefully conducted to the room faces where the miners are at work.

A Rugged Blower Unit

In the production of water gas, whether for purposes of power or illumination, the blower unit plays an important part. As it is constantly called upon for severe service, its reliability is responsible for the continuous and satisfactory operation of the plant.

At the works of the Lynn Gas & Electric Co., there is an interesting installation of a turbo-blower. This is shown in the accompanying photograph. The set consists of a Sturtevant, type 5 steam turbine, direct-connected to a No. 9 gas blower of the same manufacture, and is used to blow the gas generators.

The turbine is operated intermittently, being started and stopped by a chain which is attached to a quick-open-



BLOWER DIRECT-CONNECTED TO STEAM TURBINE

ing valve. This subjects both turbine and blower to sudden and severe variations in load and speed, which are a constant test of reliability and rugged construction.

This set, which has been in constant operation ever since January, 1912, and has received practically no attention except for oiling, has never given the slightest trouble in any way, in spite of the fact that it is called upon to undergo the severe service outlined above, for 15 hours every day.

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The Production of Coal in Michigan During 1912

The production of coal in Michigan in 1912, according to E. W. Parker, of the U. S. Geological Survey, amounted to 1,206,230 short tons, valued at \$2,399,451. Compared with 1,476,074 tons, valued at \$2,791,461 in 1911.

Of the total production in 1912, more than half (635,560 tons) was mined by machines, of which 125 were in use. Of the remainder, 433,222 tons were reported as shot off the solid, and 120,637 tons as mined by hand.

The number of men employed in the coal mines of Michigan in 1912 was 3133, a decrease from 3323 men in 1911, and the average number of working days decreased from 218 to 183.

Don'ts for Inside Employees

BY ANTHONY BARRETT*

SYNOPSIS—A concise statement of essential precautions for coal miners, based on long observation and experience in anthracite mines.



1. Don't pass the firebosses' station without first seeing the fireboss.
2. When the fireboss notifies you there is gas in your breast, don't go up in it until the gas is removed.
3. Don't start to work at the face before examining and seeing that it is safe.
4. Always cut your fuse off the roll before you put the cap on it, then tighten the cap with a crimper. Never use your teeth as it is a dangerous practice.
5. Don't push the charge in the hole with a drill. Use a wooden tamping stick.
6. Don't light your squib with your mining lamp when using black powder. Use a piece of touch paper.
7. Don't neglect to place your prop as soon as you have room. It is too late after you are injured.
8. Don't neglect your brattice. Put it up as soon as you have room to build.
9. Don't stay and work in your breast if the top is working. Leave and go for the fireboss and tell him about it.
10. Don't leave your breast at quitting time before you examine to see if it is all right. There may be a feeder of gas burning.
11. Don't fire a hole when driving a heading to another breast before you have told the party on the other side about it. Always get an answer when you rap to him.
12. Don't go into old workings. There may be gas there of which you are not aware.
13. Examine your safety lamp before going down the shaft. If you find any fault with it, show it to the foreman or fireboss.

RULES FOR GANGWAY MINERS

1. If you are using fore-poles, don't take the cut out before putting in the poles. You may get hurt.
2. Don't use black powder and dynamite in the same holes. It is dangerous.
3. Don't let the laborer work at the face when you are not there.
4. Don't leave the colliery if there is any gas in the gangway or chute before you tell the foreman or fireboss about it.

RULES FOR DRIVERS

1. Don't beat your mules with a club or piece of lagging. Carry a whip and use your best judgment when to use it.
2. Don't form the habit of shouting at your team. They may become excited and turn the wrong way, causing an accident.
3. Don't ride on cars in a gangway where the timber is low. Walk alongside of your team.
4. Don't pass, when going in, a lagging or plank

that is lying on the gangway, it may trip you when coming out, thereby causing an accident. Stop when you see it and place it out of the way.

5. Don't fail to report to the loader boss or repairman if you find a bad joint in the road. By so doing, you may avoid and prevent an accident to yourself and others.
6. Don't slide your foot on the rail or sit on the bumper of the car. Many good drivers are in the cemetery from these causes.
7. Don't allow any person to ride on your loaded trip.

RULES FOR LOADERS

1. Don't uncouple your car while it is in motion. Have the driver stop first.
2. Don't go up in the breast when you want to load. Rap on the battery for the miner.
3. Don't ride on loaded mine cars.
4. Don't clean off the rail with your hands. Use a shovel.
5. Don't pick up a piece of coal before you have examined to see if it is shattered. When shattered lift it up to your waist and let it drop on the platform, then you can shovel it into the car. Shattered coal may break in your hands while loading it into the car, thereby causing injury.
6. Don't forget to report to the fireboss when the gangway timber is crushing.
7. Don't unload timber and sheet iron on the gangway. Put it on the platform.

RULES FOR LOADER BOSSES AND REPAIRMEN

1. Don't walk along the gangway in the morning as though you were outside of the mines. Examine the road and top as you go. If you see anything wrong report it at once to the fireboss. If there are any laggings or plank lying on the gangway, place them on the platform, or some place where they will not cause an accident.
2. Don't be careless about erecting a battery. Make it air-tight.
3. Don't unload plank along the gangway. Put it up in the chute.
4. Don't allow any person to ride on the locomotive except those in authority. Allow no one to ride on a loaded trip.

RULES FOR DOOR BOYS

1. When trip is on inside stay on the inside. When on outside stay on the outside of your door.
2. Don't let the door stand open longer than is necessary.
3. Never leave the door at quitting time until all the drivers are out.
4. Don't bring books or papers to read while at work as you may get interested in reading them and forget the door, causing an accident.
5. Don't go to sleep at your door.

These are simple rules which, if practiced, may be the means of preventing injury and possible loss of life.

*Inside foreman, Wadesville Colliery, Philadelphia & Reading Coal & Iron Co., Pottsville, Penn.

SNAP SHOTS IN COAL MINING

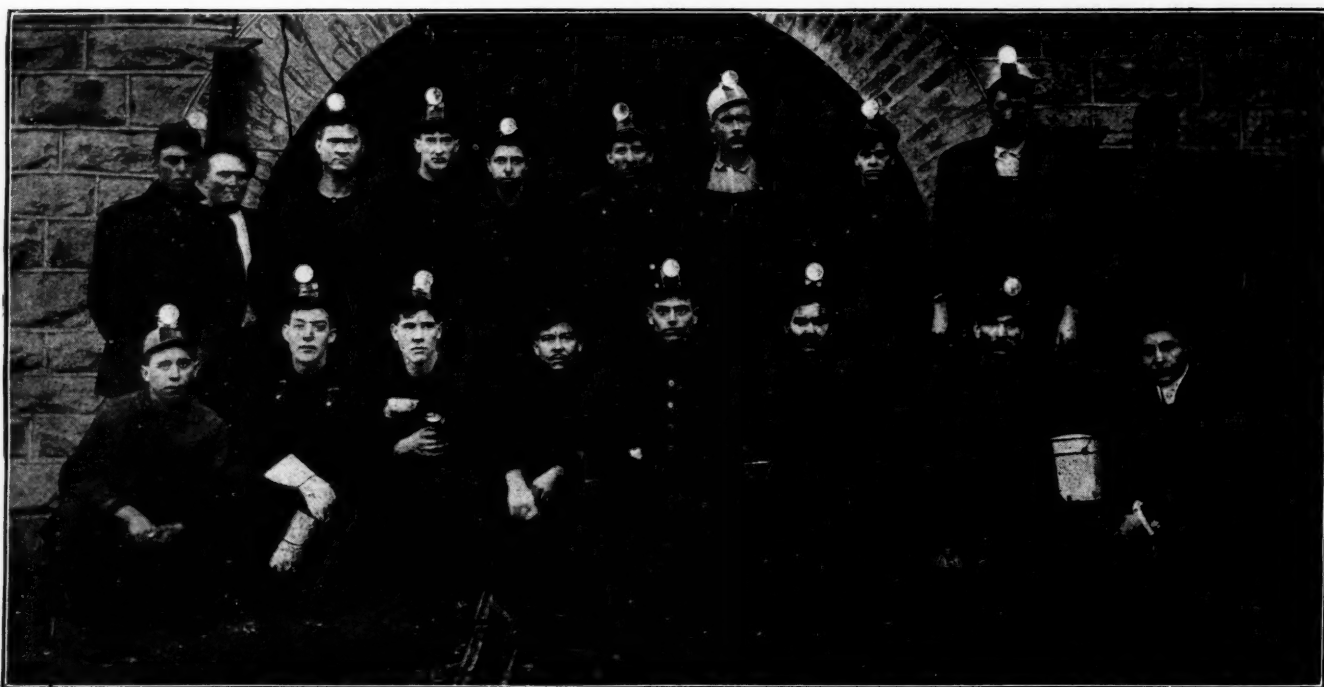


CONSOL BREAKER, HILLSIDE COAL & IRON CO., AVOCA,
PENN.

TIPPLE AND POWER HOUSE OF SUNNYSIDE COAL MINING
CO., STRONG, COLO.



CANADA WEST COAL CO.'S PLANT, AT FABER, ALBERTA, CAN.
(Produces a high grade of domestic coal, and has a capacity of 2000 tons per day.)



GROUP OF MINERS AT A VIRGINIA BITUMINOUS OPERATION
(Each man is shown wearing a new type "Hirsch" electric lamp.)

How To Reduce Falls from Roof and Sides

BY D. J. GRIFFITHS

SYNOPSIS—This is a paper which was delivered at the June meeting of the Rocky Mountain Coal Mining Institute and provoked a good deal of discussion, as attacking any method of systematic timbering.

Beyond doubt it is practically impossible to eliminate all chances of accidents from falls. Mother Earth is not going to give up her treasures without some sacrificing on our part.

This particular question ranks among the important subjects connected with coal mining, and has been given less attention as a factor of life and limb destroyer than any other cause. The single fatalities which happen, create very little attention, nevertheless, when counted up at the end of the year, they outnumbered the unfortunate ones that are mowed down on the wholesale by mine explosions.

Firedamp and coal dust were often considered as the greatest evils in coal mining. All records, however, prove this conclusion to be wrong; the second annual report of the Bureau of Mines, gives the loss of life caused by falls of coal and roof in 1910 as 1310 and in 1911, as 1321.

The reports of Pennsylvania Mine Inspectors for a period of 33 years, show that 59.38 per cent. of all the accidents underground was caused by falls of roof and coal. Also, the Bureau of Mines shows in their last issue on fatalities that accidents from falls of roof and coal killed more men than any other two causes combined, and that they account for more than half of the deaths underground.

It seems we are getting too accustomed, taking too many things for granted, running too many risks, trusting too much for the best and preparing too little for the worst. We must remove the cause then the effects will cease. However, I can see that a better day is here.

The main damaging factors underground are falls of roof and sides. Bad roof is tender and lacks the adhesive qualities to sustain its own weight over comparatively small areas. A roof of any character which is frequently penetrated by well defined slips and cleats, is characterized as treacherous roof. The carelessness of men has been one of the main causes of most of the accidents in mining as well as in any other industries.

THREE GRADES OF MINERS

Miners can be classified into three distinct grades, to wit: The experienced and careful, the experienced and reckless, and the unexperienced. The accidents with which the first class usually meet, occur through the carelessness of their coworkers as well as through accidents which are termed unforeseen, such as falling roof between timbers, and between the timbers and the face of the coal. This may have previously given evidence of being absolutely sound and safe, but be released by invisible slips or by sudden outburst of occluded gases in large quantities, as we term big blowers or feeders, or by a sudden squeeze and seismic movement. The competent but careless or unenergetic miner takes too many chances under

threatening pieces of roof and sides and the coal at the face, neglecting to timber or pull down roof as the conditions demand. The unexperienced most of the time put up the timber in the wrong places. Owing to the scarcity of skilled miners, the mines of the West employ annually hundreds of men who are far from being familiar with all phases of danger, and therefore are not watchful.

There are causes that make or transform safe roof into dangerous roof. First: Poor or inadequate ventilation causes the roof and sides to disintegrate, while decomposition of timber is noticeably hastened in the presence of highly contaminated air. The men become depressed and indifferent, losing alertness, quickness and ambition. In a sluggish atmosphere the men cannot see the same as if the air is good. J. S. Haldane and T. L. Llewelyn, British Experts on Mining, have recently made experiments to determine the degree to which lamps are dimmed by the presence of impurities in the air. The results show that every diminution of one per cent. in the oxygen present, lowered the illumination power of a safety lamp, burning colza oil and paraffin 3.5 per cent, and I assume that it also affects the hearing of men to a certain degree. Therefore, in as much as poor ventilation is a factor of so much importance in damaging property and crippling life in all directions, it is one of our chief duties to see that the volume of air is sufficient and see that it is as nearly perfect in quality as practicable, and that the air is properly conducted through the various parts of the workings. Secondly, lack of sufficient pillars for support renders the roof unsafe. The pillars should safely bear the load; small pillars permit squeezes at the face and on the haulage roads, so causing the roof to fall, and many deaths are a result.

BLASTING OFF THE SOLID

Blasting off the solid is injurious to the roof. The expansion of the powder is upward as well as downward and sideways. The flying coal knocks out the props and sometimes breaks them in two, allowing the roof to fall or giving it an opportunity to become released. The resetting of displaced timber is hazardous work. In southern Colorado, the coal is undermined so that the danger from flying coal has been practically eliminated.

I am pleased to say that the motto of the majority of the companies, today, is Safety First.

The miner is better taken care of today than ever before. The fireboss makes a thorough inspection of the roof and ascertains as well that the place is perfectly free from firedamp and blackdamp, and adequately ventilated. The pitboss visits the working places every day, and frequently the superintendent enters the place. It is becoming common for companies to have inspectors, who devote all their time to the health and safety of the underground employees, and further, we have more state inspectors than before.

In the mining world there is at present a controversy over the methods of timbering. Some believe in systematic timbering, where there is a maximum for the distance between each prop. The idea looks good on the

*Note—Abstract of paper read before the Rocky Mountain Coal Mining Institute, Salt Lake City, Utah, June 12, 1913.

surface but when carefully analyzed, it falls short. In the first place, it would create a tendency on the part of the miners to timber their places according to the specified rules, losing sight of the importance of putting the timber where they would be most serviceable. Moreover, it would make the officials neglectful of sounding the roof, as they would see the place thickly timbered and the law complied with. A system cannot be applied that can be of any benefit, where conditions vary in every foot of advance in a room, entry, pillar and cross-cut. In my opinion, mine timbers should be set in such a manner that they will give the greatest degree of safety. Conditions of the roof govern where and how many timbers, and what kind of timbering is needed. The trouble is not the failure to use sufficient timber, but to place them where they are needed. It is necessary to sound the roof often and place timber according to the sound.

How can a method of systematic timbering prevent a pot hole, a trough-shaped rock, and various other shapes of rocks surrounded by slips, from falling? There can be no set rule for placing props. The people that advocate systematic timbering, must believe that all the miners are inexperienced, and that the company officials never visit the miners' places. Firebosses, pitbosses and company inspectors visit the places every day and other officials occasionally. I am afraid by compelling men to timber according to fixed rules, the standard of safe timbering would be lowered. Such an attempted remedy would create a larger number of accidents.

Eight years ago the British Inspectors of Mines insti-

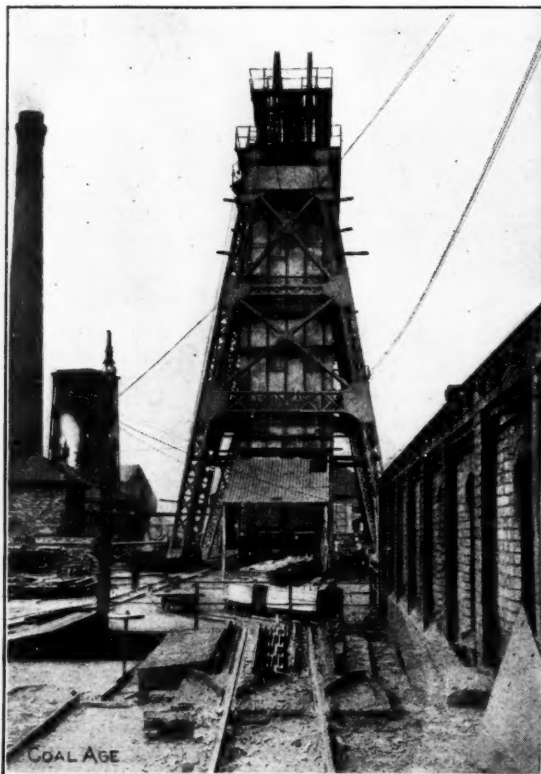
tuted inquiries to ascertain whether the earth trembling had any effect upon falls of roof and sides in the mines. They appear to have taken this course, because the adoption of the new special rules to secure the roof did not reduce the number of falls; falls of roof and sides continued to be as disastrous a source of accidents as in the presystematic days.

SYSTEMATIC BETTER THAN NO TIMBERING

I take it for granted that someone will say that systematic timbering has reduced the fatalities in some sections of the country. In answer to that, I will say, yes. But why? Because previous to that very little attention had been given to the men and the roof, so that any kind of a system would naturally help matters in those particular sections. We cannot have a set rule to hold the roof any more than we can establish a rule to fight a fire in a mine where practically all the coal had been extracted. It would be a good move in the right direction to see that all the miners and timbermen are equipped with axes and saws in perfect condition. If the tools are not in perfect condition, they will postpone timbering. Every post should be set with a cap-piece, which should be in thickness the width of the prop and a little wider than the width of the prop. Under great pressure the cap-piece is liable to split the prop if it is not covering the whole end.

And further, I advocate a good electric lamp; one that has illuminating power to expose the joints of the slips and breaks.

Views at a British Colliery



Headframe at No. 1 deep pit



Cylindrical tipplers in the screening house



General view of entire surface plant

THE SHELTON IRON, STEEL & COAL CO.'S COLLIERY IN STAFFORDSHIRE, ENGLAND

The M-O-I. and Kokoal Dealers' Convention

BY A. T. SHURICK

SYNOPSIS—A description of one of the most important conventions of coal dealers that has ever yet been held. About 700 members of both societies were present. A number of important papers were presented and considerable discussion was devoted to the relationship between the coal industry and the railroads.

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The joint convention of the Michigan-Ohio-Indiana Coal Dealers Association and the Order of Kokoal, at Cedar Point, Ohio, on June 17, 18 and 19, brought together one of the largest and most representative assemblages of coal dealers and wholesalers that has ever met. These are the two most powerful organizations of their kind in the country, and this was the second occasion on which they have met in joint convention. Add to this propitious weather conditions, an ideal place of meeting and all the requisites were at hand to assure an excellent attendance.

THE KOKOAL'S ANNUAL MEETING

Members and guests of the two associations began registering at the Breakers Hotel at Cedar Point on the morning of June 17. Cedar Point is about three miles by water from Sandusky, and the Breakers Hotel, which was the headquarters, proved all that could be desired; it was not yet opened up actively for the summer trade and the coal men had it practically for themselves.

The Kokoal meeting, which was scheduled to take place in the morning, was not held till 2:30 p.m., due to the nonarrival of members until that time. The meeting was called to order by Imperial Modoc Coleman who introduced Vice-President Ballard, of the M-O-I.; the latter extended a hearty welcome to the Kokoal members which was appropriately responded to by Past Imperial Modoc A. M. Hull, of the Kokoals.

Following this, Imperial Pictor Lester read the secretary's and treasurer's annual report. In this he commended the work of the Birmingham Breaker in general, in the highest terms, and W. C. Adams, of that breaker in particular, following with remarks on a number of the other more successful breakers. Mr. Lester regretted that in order to obviate the possibility of a deficit the sum of \$300 had been donated by a number of companies who indorsed the principles and work being done by the order.

Imperial Modoc Coleman's paper was then read. His address was confined almost entirely to the weakened condition of the society's membership. The records showed that only about 50 per cent. of the members had their dues paid up and in addition to this he deplored the inactivity on the part of the local breakers. He stated that he had attempted to strengthen the order's financial position by the opening of a new membership designated as associate members. The initiation fee was to be \$5 each and he had hoped to secure some 2000 members but had only succeeded in getting about 70.

Mr. Coleman said that he now favored cleaning out all the "Dead timber" from the society's membership and making a new start. He is also of the opinion that all members should be affiliated with some local breaker and that the latter be held responsible for the collection

of all dues of its members. On the question of initiation of new members he thought that the present system was becoming rather old and should be brought uptodate. He concluded his remarks with an expression of his sincere appreciation of all the assistance given him by the members, press, etc.

Mr. Adams, of the Birmingham Breaker, then made a short talk on rejuvenating the organization. He quite pertinently pointed out that there was no other industry in the world producing such a staple product as coal and yet so loosely organized as the coal dealers were; and in his opinion there was no other organization that could be established on so high a plane were a reasonable effort made. He ascribed the success of the Birmingham Breaker to the concerted action, coöperation and close interests of the individual members and concluded by stating that the coal men should be impressed with the advantages to be obtained by organization.

The session was concluded by the Imperial Modoc appointing a committee on resolutions and another on constitution and bylaws which were to report on Thursday.

In the evening one of the most enjoyable koruskations ever held was given by the Birmingham Breaker at which eight new members were initiated into the order. Complimentary cigars from the Minneapolis delegates were distributed to all who attended the evening meeting.

At the end of the first day 431 members and guests of the two societies were registered.

THE M-O-I. MEETING ON WEDNESDAY

The annual meeting of the Michigan-Ohio-Indiana Coal Association was held in Con-



THE OFFICIAL BADGE

vention Hall at 10:10 a.m., on June 18, President Lake presiding. The opening address was made by President Ryan, of the Cedar Point Resort Co., who extended a hearty welcome to the visitors on behalf of his company. Mr. Lake responded with a few appropriate remarks, and was followed by G. A. Ballard, chairman of the executive committee who made a short talk on the organization of the convention.

President Lake's annual address was then given. He stated that he had not expected to be present because of a serious illness and had not therefore prepared a formal paper, but he delivered one of the most interesting talks of the session, confining his attention mostly to the association and its work. He found that this was growing

quite rapidly and he now considered it one of the most powerful in the country. Evidence of this fact was clearly shown in the recognition accorded the association by the large transportation companies, there being nine representatives of these latter present at the meeting; it was obvious that they were awakening to the necessity of working in closer harmony with the coal men and also to the importance of their organization. It was only within the last few years that shippers had been able to recover for losses in transit and this was a result that he had long predicted, and it was gratifying to him that his prediction had proved true.

The next evil of this character to be corrected, is the car-service rules. Railroads carefully specify that they are not liable for "acts of Providence," but, on the other hand, the coal man must fulfill his agreement regardless; it is a poor rule that does not work both ways and he believed that the association should push this issue aggressively. However, he was of the opinion that when the transportation companies become better acquainted with the coal men and more familiar with their troubles that a better understanding would prevail and such difficulties easily adjusted.

CONCERNING THE RETAIL PRICES OF COAL

On the question of the retail selling prices of coal, about which there has been much unfavorable comment in the press of the country, Mr. Lake stated that this was entirely unjustified and unfair. He said that the dealer could not handle coal under average year around condition for less than 70c. per ton, and in view of the fact that New York retail prices are from \$1.50 to \$2 per ton above the wholesale, this seems to be a modest estimate. Some dealers might believe they could do better on this price, but unless they kept accurate accounts and made full allowance for depreciation and other charges they were not in a position to determine this and should be careful about selling low. He then cited conditions in other industries, such as the drygoods, for instance, where a profit of 20 to 25 per cent. was demanded; this is much more than the dealer expects.

He concluded by extending his sincere personal thanks to J. A. Ballard and the committee for the efficient and able way in which they had handled the meeting.

The treasurer's report was then read and this was followed by the secretary's report. During the past year there were 248 claims filed against the railroads, of which 23 were declined, 101 collected and 124 still pending; the total amount involved was \$4547.80, of which \$2056.60 was collected. The total membership is 1790, of which 192 were taken on during the year and 63 dropped out for different reasons. Cash on hand to the middle of June was \$436.60 as compared with \$456.78 at the same time last year.

Following this the papers of members were read in the order given herewith:

"Coal the Essential." By Frederick W. Saward, of the *Coal Trade Journal*, New York.

"Anthracite Conditions—Your Troubles and Ours." By D. F. Williams, Scranton, Penn.

"Coöperation as between the Coal Man and the Railroad." By J. B. Nessel, general coal and ore agent of the New York Central Line, Pittsburgh, Penn.

"Value of Railroad Claim Department." By H. B. Wolf, Marion, Ind.

"Result of Coöperation as between Shipper and Dealer."

By W. J. Hamilton, Columbus, Ohio.

A committee of nine (three from each state) on nominations was then appointed and instructed to report later, and the president concluded with the statement that this had been one of the most interesting sessions the association had ever held.

THE BOAT RIDE IN THE AFTERNOON

In the afternoon the members and guests of both societies had an enjoyable sail on the steamer "G. A. Boeckling." The steamer left at 2:45 p.m. and crossed the bay to the Sandusky shore, passing by the B. & O. R.R. coal docks. These are equipped with two loading derricks and under them are the bins of Bert Smith, a local dealer. After touching at Sandusky, the steamer proceeded down the shore line past the Big Four R.R. docks and on down to the Short Line (Pennsylvania R.R.) piers.

At this point the operation of picking up entire railroad cars and dumping them into the vessel's hold was witnessed; the freighter "A. B. Stewart," of about 10,000 tons capacity, was being loaded at the rate of about one railroad car every two minutes. From here the steamer turned out to Johnson's Island, at which point all the rock is obtained for the breakwaters both at Sandusky and Cleveland; scows were being loaded by derricks at the piers there.

The return trip was made by Sandusky and hence into Cedar Point again. During the entire journey a one-man, spectacled, colored orchestra ably assisted by Mr. Draggins and others rendered excellent selections on the stern of the boat.

THE CONCLUDING DAY

The final meeting of the Michigan, Ohio, Indiana Association was called to order in the Convention Hall on June 19 with a small attendance present. The first business was the report of the committee on nominations, which was read and adopted, the officers for the new year being as follows:

President—H. H. Deam, of Bluffton, Ind.

Vice-President—James A. Ballard, of Detroit, Mich.

Treasurer—W. A. Gipson, of Upper Sandusky, Ohio.

Directors—Robert Lake, of Jackson, Mich., to succeed George T. Calvert; W. G. Voegelé, of Mansfield, Ohio, re-elected; J. W. Landrum, of Terre Haute, Ind., to succeed H. H. Deam, and H. B. Wolf, of Marion, Ind., re-elected.

The new president was installed, appropriate addresses being made by both him and retiring President Lake. Talks on the following subjects were then given mostly in an informal manner:

"Looking Things Square in the Face." By Benjamin F. Cobb, Monon Bldg., Chicago.

"Value of Sociability in Business." By D. W. Sherry, Connersville, Ind.

"The Value of Gaining Public Confidence." By H. P. Gaukler, Pontiac, Mich.

"Credits." By H. W. Kelly, Angola, Ind.

"Preparing Your Selling Talk." By C. H. Enderlin, Chillicothe, Ohio.

The meeting was concluded with the adoption of a resolution extending a hearty vote of thanks to the Cedar Point Resort Co. and others for the many courtesies and

unfailing attention which had been accorded the members of both societies during the meeting.

In the afternoon the concluding meeting of the Order of Kokoals was held, at which the annual election of officers took place, the result being as follows:

Imperial Modoc—James A. Ballard, sales manager Semet-Solvay Co., Detroit, Mich.

Imperial Baron—W. C. Adams, sales manager Alabama Fuel & Iron Co., Birmingham, Ala.

Imperial Baronel—A. J. Moorshead, president Madison Coal Corporation, St. Louis, Mo.

Imperial Baronet—George W. Edmonds, George B. Newton Coal Co., Philadelphia, Penn.

Imperial Pictor—R. S. Jones, Berwind Fuel Co., Minneapolis, Minn.

Imperial Mazumer—E. V. Sidell, retail coal merchant, Poughkeepsie, N. Y.

Imperial Gazook—Daniel Howard, Central Fairmount Coal Co., Clarksburg, W. Va.

Imperial Pit Boss—John A. George, president Indianapolis Coal Co., Indianapolis, Ind.

Imperial Acolyte—F. C. Atwill, Atwill-Makemson Coal & Coke Co., Chicago.

Imperial Swatta—G. T. Rider, Scanlon Coal Co., Louisville, Ky.

Imperial Spotta—Pratt Thompson, Lehigh Coal & Navigation Co., Hartford, Conn.

THE EXHIBITS

F. S. Converse, of Binghamton, N. Y., manufacturer of coal-handling tools and machinery, had one of the largest exhibitions at the convention, showing a line of chutes, screens, bags, baggers, etc.

One of his products which attracted considerable attention was the Converse Portable Rotary Screen for re-screening coal. The screen is cylindrical in shape and covered with wire screen of different mesh set on a frame and fed by a hopper; the whole equipment is on wheels so that it is readily moved about. The object of the device is to eliminate what commonly requires three distinct operations when screening the coal over a yard screen.

The exhibit of the *Domdoff & Joyce Co.*, of Cincinnati, Ohio, attracted considerable attention, owing to the large variety of cokes and coals displayed. The company was represented by Charles A. Sargeant, secretary, and W. H. Underwood.

The *New York Coal Co.*, Columbus, Ohio, operating eight mines in the Hocking Valley district in the Nos. 6 and 7 veins, was also an exhibitor, displaying Manhattan washed coal. They claim to have the largest coal-washing plant in the East; it has a daily capacity of 1500 tons of washed coal. The coal on display was the various sizes used by retail dealers. They also showed photographs of the washer plant, revolving screens and cars loaded with Manhattan and Knickerbocker rescreened lump.

The *Gifford Wood Co.*, of Chicago, exhibited a working model of a retail coal-yard pocket which was one of the most interesting features there. The model was in operation much of the time and proved of interest to the visitors. In addition to this, they had different sizes of gravity-discharge buckets and steel-roller chains with special self-adjusting attachments.

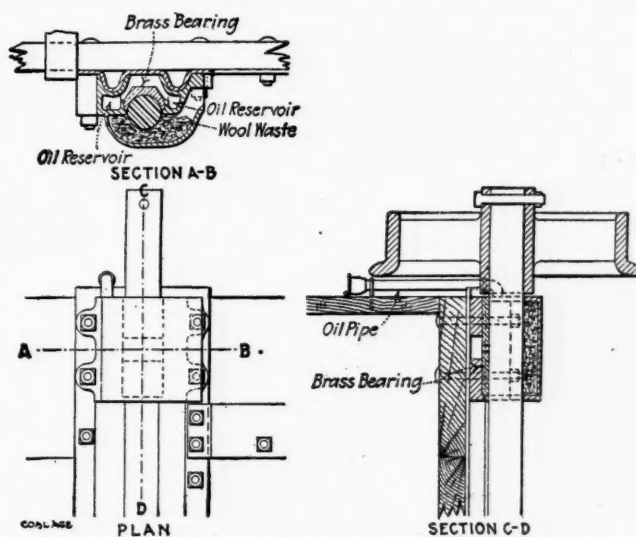
The *Hunter W. Finch Co.* had a unique exhibit in the shape of a block of Dixie Diamond Block coal from old Kentucky and to the dealer who came nearest guessing the weight of this block, a car load of the same coal was to be given free. The company was also distributing lapel watch chains and a handy little bullet pencil.

✱

A Substantial Journal Box

Although the railroads have for many years employed brass bearings in waste-packed journal boxes on practically all of their rolling stock, the mining industry has been slow indeed to follow their example. Lately, however, the Helmick Foundry-Machine Co., of Fairmont, W. Va., have perfected a journal box of this kind. This device is illustrated herewith, and embodies several features not ordinarily found in mine-car construction.

As may be clearly seen in the drawing, this journal box is waste packed, and consequently self-oiling. The waste, furthermore, is easily accessible, so that the packing may be readily stirred up or renewed without removal of the axles or wheels. Oil may be easily and quickly introduced into the waste receptacle by means of the cups and pipes fastened to the side of the car and extending above the flange of the wheel.



THE NEW JOURNAL BOX AND PRESSED CORRUGATED BASE

The top of the journal box is grooved to fit a corrugated axle base pressed from steel plate. This stiffens the bottom of the car considerably, thereby tending to prevent the axle from bending to a great extent. Heavy bolts extending entirely through the bottom of the car hold the journal box and plate securely in place. This arrangement makes an extremely strong and rigid axle base.

The axles proper are of cold-rolled steel without collars, and can be removed without taking the journal box from the car bottom. One wheel is made tight upon the axle, while the other is loose, thus allowing the car to pass around the sharp curves frequently employed in mines with a minimum of draw bar pull. The whole device is simple, compact and strong, and well adapted to the hard knocks and severe conditions invariably encountered in underground transportation.

Some Notes on Railroad Claims

By H. B. WOLF* AND J. B. NESSLE†

SYNOPSIS—Some comments on the difficulties the dealer is liable to encounter collecting damages for coal lost in transit. The railroads are prone to take a rather obstinate position in such matters and unless the shipper is able to bring some pressure to bear, his claim will usually receive scant attention. On the other hand, shippers frequently file such inadequate claims that the roads find it impossible to take action; in fact, they claim to be eagerly seeking reasons why claims should be allowed. Both sides of the question are presented.

✱
By H. B. Wolf

I have never been able to satisfy myself why a coal dealer should have any use for a railroad claims department. I believe he should buy coal f.o.b. destination and let the other fellow stand the shortage or fight it out with the railroads. The producer has always told us to accept what was in the car or make the railroads pay for whatever shortage there might be. I wish to say to the retailers that this is one of the biggest leaks in our business and should be given the same attention as the delivery and collection of a ton of coal to our customers. When we give this leak the attention it should have, the railroads will protect our coal while entrusted to them and our shortage will be less, our money more, collections for short weights will be much easier and payments by railroads more prompt.

The roads doing business in these three states are now taking notice of the retail coal dealers, and while at the writing of this paper I do not know what our secretary's report will contain as to results obtained by the association railroad claims department, I am sure that it will be a surprise to many of us. (See page 50.)

SOME COLLECTIONS MADE

Last year I determined to know something of the shortage of coal consigned to our company. I ordered some railroad claim blanks of our secretary and served notice to the railroads entering our city to weigh all cars consigned to us unless otherwise ordered.

Owing to one excuse or another by the railroads we failed to get 202 cars weighed at all but we did manage to get 159 cars weighed. Ninety-six of these overweighed or underweighed less than 1000 lb., 63 cars fell short over 1000 lb., and it is of these 63 I wish to speak. These cars were from almost all coal-shipping districts and contained all kinds of coal from \$8.66 anthracite to Indiana mine-run. The total shortage was an even 100 tons, amounting to \$369.55, or an average shortage of 3348 lb., amounting to \$5.86 per car.

The first lot of claims we sent to the railroad, but as all the satisfaction we got was a card notice, stating the number of claim, we soon changed and sent all our claims to the association, and through them we have been able to collect a great many that otherwise would not have received much attention. We have many claims still pending, but we are so confident that they are just and

that we will get them that they were listed on our inventory May 1, as an asset at their face value. It takes time to collect these claims, and if you do not get action on them as soon as you wish, do not give them up but make the railroad pay that which it owes you.

After filing your claim you will probably receive a letter reading as follows:

Beg to advise claim so and so is herewith returned to you for your withdrawal, as investigation has developed the fact that the car did not meet with any rough handling or theft while on the rails of this company or its connections.

In other words, the railroad will accept this car and issue a bill of lading, showing contents and amount, and on arrival at destination again weigh the car and issue a way bill showing a shortage over their own agent's signature. Then because they cannot find where the shortage occurred, they expect you to believe there was no shortage.

I do not wish to leave the impression that all roads are alike on the question of settling short-weight claims. Our experience has been varied with the four roads entering our city. One road, whose chief revenue comes from carrying coal, had a car of coke it had hauled from the ovens, a distance of 40 miles. I ordered the car over to another road for delivery to one of our yards, and also ordered this latter road to weigh the car, for which they charged \$1. It was short 2000 lb., amounting to \$3.35. I filed bill for this amount plus the \$1 that had been charged by the other road for weighing, and the whole claim was allowed.

By J. B. Nessle

No industrial or railway-traffic man claiming Pittsburgh as his home can hear the word coöperation mentioned in any discussion without swelling up a bit, and if at all possible to do so he finds an opportunity to speak of the Traffic Club of Pittsburgh. This organization, founded some ten years ago, is made up of representatives of the principal industrial organizations and railway-traffic officers whose business interests are located within what is known as the Pittsburgh district. The watchword, object and practice of this organization is coöperation as between industrial interests and railroads first, last and all the time, and it is with a feeling of great pride on the part of members of this organization that they point to the records made in the Pittsburgh district in the adjustment of the many questions that come up from time to time as between railroad and industrial representatives which are amicably settled without recourse to commissions or the courts.

THE VALUE OF ORGANIZATION

This organization has brought the railroad representatives and the shippers of the Pittsburgh district in a close personal relationship with each other. Instead of each trying to find a way to embarrass the other, they are today and for some time have been devoting their energies in an effort to harmonize any differences that may exist and coöperate to the fullest extent.

People wonder and ask the question, why is it that the Pittsburgh shippers are not down at Harrisburg advocat-

Note—Abstract of papers read before the M. O. I. Coal Association at Cedar Point, Ohio, June 18, 1913.

*J. G. Wolf & Sons, Marion, Ind.

†General coal and coke agent, N. Y. Central Lines West.

ing and insisting upon the passage of an air-tight public-service law and the establishment of a public-service commission? The answer is that through the application of the principle advocated by the Traffic Club, insofar as the steam railways and shippers are concerned, a public-service commission is not necessary in order to secure and protect the rights of either interest.

There is absolutely no community anywhere approaching the size of the Pittsburgh district where so few complaints before state or interstate commissions are filed by the shippers against the railroads. We have a way of settling these things out of court; largely through the spirit and influence of coöperations as advocated by the Traffic Club.

With a membership scattered over three or more states your organization and the railroad cannot, of course, get as close together as we do in Pittsburgh, but it is quite apparent to me that the association certainly appears to have adopted coöperation as its watchword. If we are to judge from the manner in which the officers of this organization are endeavoring to handle the questions arising from time to time and attend to the disputes that are brought to their attention by members as against the carriers, there is absolutely no doubt that the vast army of coal dealers throughout the country and the railways are going to be brought closer together, and to a better and clearer understanding of each other's troubles and requirements.

Railroads have been blamed for lack of interest, desire to shift responsibility and actual refusal to pay legitimate claims. As a matter of fact, the entire trouble and responsibility for the failure to receive prompt action for adjustment of claims is often due to the claimant himself, in that he has not supplied any evidence whatsoever which would enable the railroads to even locate the shipments in question. Your officers are endeavoring to correct all this, and I wish to assure you that in the railway claim offices this effort is most thoroughly appreciated.

Coal dealers have the idea that a railroad claim office is created for the purpose of finding excuses, evasive language and reasons why a claim should not be paid, without the slightest regards to its merits. It is possible that in the past there may have been some grounds at least for this suspicion, but I feel quite safe in saying at this time that instead of finding a way not to pay claims, they are today bending every effort to find a way to settle all legitimate claims promptly. In other words, we want to find a way to pay your claims at the earliest possible moment.

THE RAILROADS REQUIRE HELP

Another instance in which your association is coöperating with the railroads is the advice they are giving us from time to time where your members report pilferage. A number of these cases have been reported to me by the secretary and the information has been welcome, since it has given us an opportunity to so police the points mentioned as to eliminate entirely the losses. You all realize, I am sure, that it is absolutely impossible for railroads to carry a detective on each car of coal, or to police the entire line of their road in such a manner as to absolutely prevent the possibility of someone getting on and throwing off coal from cars in transit. But we can and will prevent this wherever possible to do so, and when your

members notify the carriers that at a certain place systematic stealage is being practiced, you are doing the railroads and the coal trade a positive service.

Another thing the officers of your association are doing through advice from members is calling attention to the railroads where they find the agents engaging in the coal business to the detriment of the legitimate dealer in the town in which the agent is located. The carriers welcome this information, since they are not always able to check up on this sort of business, and it enables them to at once break up the practice. It is hardly necessary for me to assure you at this time, insofar as the lines I represent are concerned, and I believe this to be true of practically all of the railroads in the territory, that we are absolutely opposed to our agents engaging in coal or any other business to the detriment of the legitimate shippers located on our lines.

Your organization is one that can accomplish a great deal for the coal dealers and at the same time in many ways help the railroads, and I feel confident in predicting that, notwithstanding all that may have happened in the past, we may reasonably expect the "dead past to bury its dead" and find the representatives of the coal trade and the railroads, like the lion and the lamb of old, lying down peacefully together.

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A Comparison of Fatal Accidents

The following is a comparison of the fatality rates of the H. C. Frick Coke Co., with those of Scotland, South Wales, and Great Britain. These figures were given at the recent meeting of the Coal Mining Institute of America.

DEATHS PER MILLION TONS PRODUCED			
	1910	1911	1912
Scotland	5.06	4.12	3.50
South Wales	5.60	5.67	6.53
All Britain	6.54	4.47	4.52
H. C. Frick Coke Co.	1.99	1.72	1.88
TONS OF COAL PRODUCED PER DEATH			
Scotland	197,600	242,000	285,000
South Wales	150,700	176,100	153,000
All Britain	137,100	243,500	248,000
H. C. Frick Coke Co.	502,049	578,151	531,328
DEATHS BY FALLS PER MILLION TONS MINED			
Scotland	2.10	1.76	1.86
South Wales	3.18	3.20	2.79
All Britain	2.36	2.33	2.03
H. C. Frick Coke Co.	0.97	0.90	0.70
DEATHS BY CARS PER MILLION TONS MINED			
Scotland	0.68	0.84	....
South Wales	1.68	1.47	....
All Britain	1.02	0.98	0.87
H. C. Frick Coke Co.	0.79	0.41	0.91

The H. C. Frick Coke Co. produces twice as much coal per death as the bituminous region of Pennsylvania, Ohio and Illinois, three times as much as West Virginia and South Wales and twice as much as the whole of the United States.

Figures for Scotland, South Wales and Great Britain were taken from the "Blue Book," published by the British Government. Figures for Pennsylvania, Ohio, Illinois and West Virginia were taken from the year book, published by the mining department of those states. Figures for the United States were taken from Technical Paper No. 48, United States Bureau of Mines "Coal-Mine Accidents in the United States."

✱

To preserve iron from rust, immerse it for a few minutes in a solution of blue vitriol, then, in a solution of hyposulphite of soda, acidulated with hydrochloric acid. This gives a blue-black coating which is affected by neither air nor water.

Selection of Portable Electric Mine Lamps

BY H. H. CLARK*

SYNOPSIS—The purchaser of a portable electric mine lamp will consider not only its safety but the cost of maintaining it, its weight and the candlepower. In considering the latter, due weight should be given to the manner in which it is evaluated, that is, whether the average or the "head-on" intensity of light is considered and whether the lamp has or has not a reflector.

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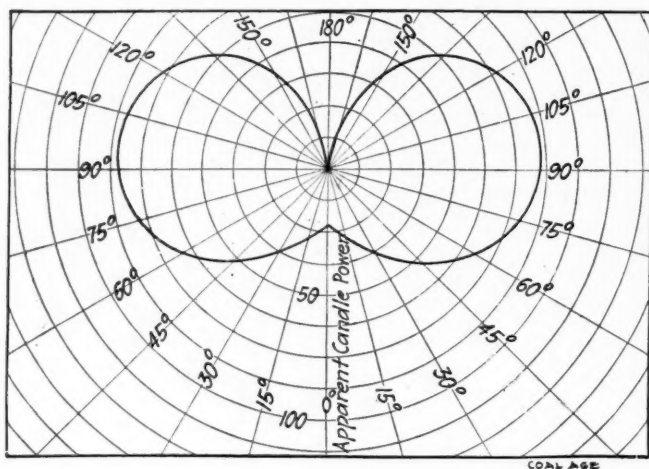
Portable electric lamps first of all should be safe; that is, they should not be capable of igniting gas and should not be so poorly constructed that a man will be left in darkness, due to failure of any part of the lamp equipment. The lamp should give the proper amount of light for from 10 to 12 hours on one charge of the battery. The lamp equipment should be as light as possible so that the burden of carrying it and working with it may be reduced to a minimum. Some of these qualities are more

durable, but I cannot give any definite information as to their relative life, although tests are now under way to determine this fact.

The candlepower that these bulbs will give is not a fixed quantity, as it varies with the voltage at which the lamps are burned. If a lamp designed for two-volt service is burned at less than two volts it gives a considerably decreased candlepower and has a considerably longer life. If, on the other hand, it is burned at $2\frac{1}{4}$ volts its candlepower would be largely increased and its life proportionately shortened. It is not always a good sign to see a lamp bulb glowing with extreme brilliancy, because it may mean that it is being burned at too high a voltage and may last but a few hours under such conditions.

CANDLEPOWER RATINGS

Up to the present time, so far as I know, no standard candlepower rating of portable electric lamps has been

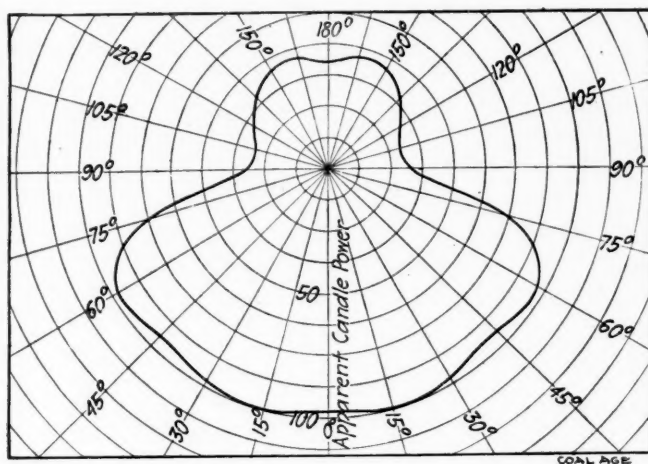


SHOWING HOW THE INTENSITY OF LIGHT FROM A LAMP BULB VARIES

or less apparent after a brief examination. There are other qualities that are not so easily determined and I will mention a few of them.

LAMP UPKEEP

It is important that the cost of repairs and upkeep of portable electric lamps should be reduced to a minimum. Nor must the interruptions of service, due to equipments getting out of order, be overlooked. The principal item of upkeep is the expense of replacing the lamp bulbs which have been burned out. The life of these is, therefore, an important consideration. The manufacture of miniature lamp bulbs does not seem to be thoroughly standardized in this country. Those which the bureau has examined have varied a great deal in their characteristics. These bulbs cost from 17 up to over 40c. and it may be supposed that the higher-priced lamps are more



THE SAME LIGHT WITH ITS INTENSITY MODIFIED BY A REFLECTOR

adopted. Different meanings may be given to the word "candlepower" as applied to portable electric lamps. If a man speaks of his lamp as giving five candlepower he may refer to the intensity of light given by the lamp bulb, or to the intensity of the lamp when used in connection with its reflector. In either case he may refer to the candlepower measured at one point or to the average of measurements at several points. The true candlepower of the lamp is, of course, the average candlepower that it gives over its illuminating range. Some lamps if measured from a point directly in front of their reflector will give from 5 to 10 times the candlepower that they would give if the intensity of light were measured from a point 30 deg. on either side. An effect of this sort is, of course, to be expected, but the statement as to how the candlepower is measured should always be made, because two lamps that really give the same amount of light give widely different candlepowers when measured "head-on."

As an illustration: Two lamps give the same amount of light, but the "head-on" candlepower of one is more than 12 times that of the other, and the average candlepower of one is nearly seven times that of the other.

*Electrical engineer, U. S. Bureau of Mines, Pittsburgh, Penn.

Note—Article read before the Coal Mining Institute of America at the summer session, June 16, 1913. The illustrations accompanying this article are added in order to exhibit how the light of a lamp varies with the point of measurement. The figures are taken from a catalog of the Luceo Reflectors.—Ed.

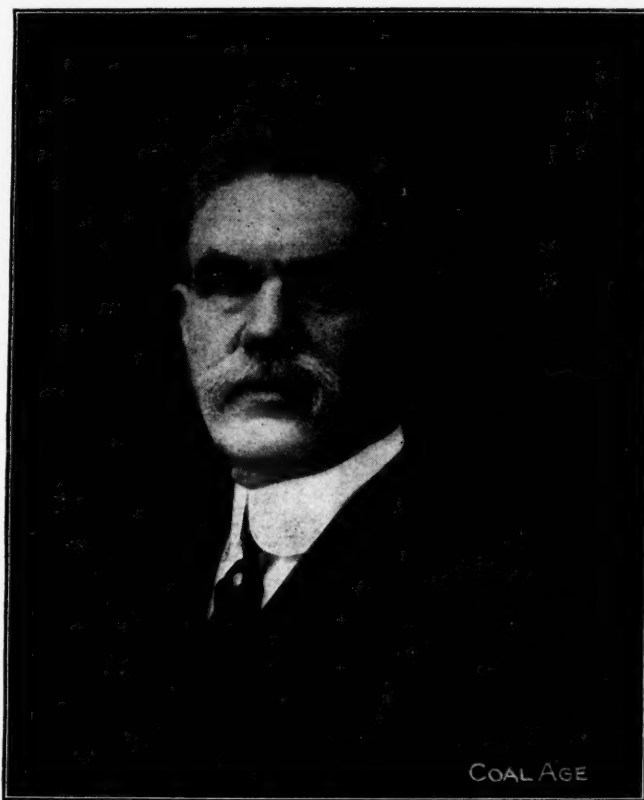
WHO'S WHO—IN COAL MINING

There are probably few mining men of eminence, whose life record shows more clearly what a true ambition, supplemented by a strong purposeful determination to rise to a sphere of usefulness, can do to achieve success, than the following simple, unsophisticated sketch of the career of of Thomas K. Adams, who is at present the oldest, in service, of the mine inspectors of Pennsylvania.

Born in 1849, near Edinburgh, Scotland, and left fatherless in six months (when the father died, leaving the mother with six children), Thomas entered school at five years of age. His early education was all included between the ages of five and eleven years, when he was taken from school (1860) and put to work in the mines of the Midlothian district, where he continued working 13 hr. each day, until 16 years of age. During all these five years of work in the mines of Midlothian, the boy attended night school regularly. Few can understand but those who have had a similar experience what it meant for a boy of tender years to work 13 hr. of the day and study at night to gain the education he so much coveted.

At the age of 16 years (1865), Mr. Adams came to this country and at once entered the mines of Mercer County, Penn., where he worked as a miner, doing all kinds of practical work. At that time, there was no law in Pennsylvania requiring that a miner should serve two years, in the mines of the state, before he could mine coal on his own responsibility.

Seeking constantly for betterment, and to secure experience and information, Mr. Adams worked for six months in the anthracite mines of Pennsylvania, and followed this with six months of toil in the mines at McAlester, Oklahoma, then Indian Territory. Then came a change. Having saved some money as a miner, Mr. Adams entered the Edinboro State Normal School of Erie County, Penn., and continued to attend that institution during four full terms. It was here that he received a good English education. Following this, he taught for a short time, as a regular teacher, in the common schools of Mercer County, Penn., to which place he had returned.



THOMAS K. ADAMS

It was not long, however, before his ambition for mining again asserted itself. While still a young man, Mr. Adams took an active part in the affairs of the Miners' Local Union and was soon appointed to the position of secretary of that organization. His duties as secretary of the Miners' Union led him into active participation in the work of securing the appointment of a mine commission, which was the first appointed (1874) in Pennsylvania. As a member of that commission, he performed excellent service in the formulation of a bituminous-mine code, which was afterward (1877) made the bituminous mining law of Pennsylvania.

In the meantime, Mr. Adams had reentered the mine, working as a miner, thereby adding to that fund of practical information and experience which, in later years, placed him in the foremost rank of practical mining men. It was while working in the mines of Mercer County that Mr. Adams (1881) went to Pittsburgh to take the first examination for mine inspector ever held in Pennsylvania. He passed this examination successfully, receiving a rank of 95 per cent., and was immediately appointed and commissioned to act as mine inspector, by Gov. Hoyt. Mr. Adams received this appointment May 15, 1881, and has continued to hold the position of mine inspector from that time, having just been recommissioned for another term.

Four years later, in 1885, and again, in 1893, Mr. Adams was appointed a member of commissions to revise the bituminous mining law, being selected chairman of the last named commission.

As a student of mining, Thomas Adams has few equals. While engaged in the numerous activities incident to the office of mine inspector, he continued his studies of mining, in correspondence and other schools; and added largely to his fund of information by the constant reading of mining books and papers. He did not confine his reading, however, to mining subjects, but devoted many spare moments to the reading of standard works of the best English authors. Mr. Adams has, by industry and frugality, collected a fine library, comprising many of the standard works on history, philosophy, theology, sciences and general literature.

Mr. Adams has thus, from the age of 11 years, supported himself and gained an enviable reputation for sobriety, industry and practical knowledge. He is a total abstainer from alcoholic beverages and the use of tobacco in any form. He has always shown an active interest in labor movements, being especially desirous for the betterment of all classes. He served as the local and district secretary of the Miners' and Laborers' Benevolent Association, and was master workman of the Knights of Labor at the time when labor officials gave their time and efforts without remuneration.

Mr. Adams is a republican in politics, a churchman of the United Presbyterian faith, and a school director in his own town. He is, this year, the retiring president of the Mine Inspector's Institute, U. S. A., of which organization he is a charter member. He states that he is satisfied to have done his best with what he modestly styled "a limited capacity."

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Our Front Cover This Week

The upper illustration on the front cover of COAL AGE this week shows the 400,000-ton bituminous coal-storage equipment built by the Link-Belt Co. for the Berwind Fuel Co., Superior, Wis. The equipment consists of four traversing bridge-tramways, two revolving locomotive cranes and three movable screening towers.

Each bridge has a span of 295 ft. and an overall length of 506 ft. Two of the bridges are equipped with three-ton buckets, and two with four-ton buckets. All motions of the bridge and bucket are controlled by one operator from either of two fixed-control stations.

Run-of-mine bituminous coal is unloaded from vessels and delivered either to storage, or through reloading hoppers on front tower of tramway direct to box or open cars for reshipment. Transfer from stock pile to cars is accomplished by similar bucket delivery to the reloading hoppers.

When sized coal shipments are desired, coal is taken from vessels or stock pile by tramway buckets to movable screening towers, which may be likened to traveling trip-les.

Slack coal, screened from the sized coal shipments, is discharged into open-top cars or conveyed to slack-storage pile, from which the cranes or tramways deliver to movable screening towers for box-car shipment as needed.

The revolving locomotive cranes travel on a track of 10-ft. gage and are arranged to operate 54-cu.ft. buckets at a maximum radius of 45 feet.

Run-of-mine storage is also tributary to the cranes for delivery to cars through the hoppers on the movable screening towers as required.

Delivery to box-cars is facilitated in all cases by traveling box-car-loading machines.

The entire plant is of the most modern construction, and is operated by alternating-current motors.

The lower illustration on the front cover shows a general view of the largest anthracite coal-storage plant in the world, built by the Link-Belt Co., of Philadelphia, for the Philadelphia & Reading Coal & Iron Co., at Abrams, Penn.

The immense tonnage of this plant is divided into eight piles—four on each side of a central railway system—each pile having a capacity of 60,000 tons. The guaranteed

performance of the equipment is 1800 tons per day of 10 hr. for each of the incline conveyors, or a total stocking-out capacity of 14,400 tons per day.

For replacing the coal into cars, each of the reloading conveyors has a capacity of 2500 tons, making the total reloading capacity of the plant 10,000 tons per day of ten hours.

This is the well known Dodge system of coal storage and is the most successful application of engineering practice to the storing of anthracite coal.

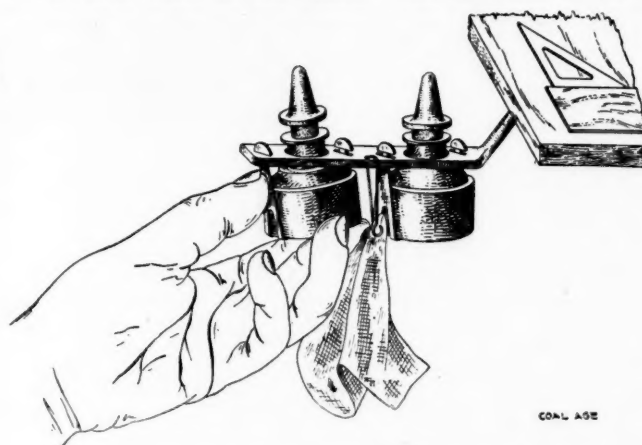
As usually arranged for open-air storage, two trimming machines and one reloading machine between them constitute a group. A storage plant comprises a number of these groups which may be of equal or varied capacities. It is, therefore, capable of extension by the addition of one or any number of groups.

"The Dodge System" is also adapted to storage under cover, and to modifications of the open-air storage, in which the trimming machine may be stationary or movable, and the reloading machine a traversing instead of a pivoted conveyor.

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A New Bottle Holder

The device illustrated below is a safe and convenient bottle holder for attachment to the underside of a drafting board. When not in use it can be swung out of the way for which purpose a pivot screw is provided. It does not interfere with the use of a tee-square on any of the four sides of the board. The holder is made of



DEVICE FOR HOLDING BOTTLES OF INK

steel, ribbed to give strength and coated with black enamel. The bottles are easily inserted and removed and when fastened into place cannot be upset. A holder for a wiping rag is part of the device. The appliance is made by Eugene Dietzgen Co., 218 East Twenty-third St., New York City.

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The December number of The Otto Cycle contains the following table showing the loss of power in gas engines at different altitudes above sea level, expressed in percentage of the power at sea level:

Altitude, feet	Loss in rated horsepower per cent.
1,000	3.55
2,000	6.95
3,000	10.25
4,000	13.45
5,000	16.35
6,000	19.45
7,000	22.35
8,000	25.15
9,000	27.85
10,000	30.45
11,000	32.95
12,000	35.35

EDITORIALS

The Man Who Speaks

There is no merit in taciturnity, in hiding all one's emotions and traveling before the world in a disguise. The successful man is a mixer who has fewest secrets from his working men. The kindly word was the source of all the friendly feeling between capital and labor in the early days and no tricky sociological device can replace it now.

The foreigner needs that word of welcome no less than the native-born. It is our duty to melt the refractory material of southern Europe in the effulgent crucible of our kindness. If we have not learned the loneliness of the alien in a strange land, we have failed to estimate the mainspring of his discontent and of his deplorable penchant for intoxicating liquors.

That place he calls home, you may call a hovel; those folk joys he cherishes may appear to you ignorant follies, but he clings to them nevertheless; the murk of the mining town may not disgust you who have not reveled in the skies of the Mediterranean, but as he recalls the latter, he sings enraptured those plaintive songs of the homeland with a voice which makes the hills ring again. And when he is at his work with his mind ill at ease, a little word of welcome in his own tongue meets with his glad response. "*Buon' giorno*" or "*Buona sera*," pronounced in his vernacular "bon jaww" or "bon-ah sarah," will lighten the morning and the evening of the Italian's discontent.

The foreigner is looking for sympathy and comprehension. Those who have been urged to partake of beer and home-brewed wine by an overurgent Italian host will readily bear witness to the fact that if the stranger long remains a disgruntled alien it is because we have failed to return with a smile the advances he has made to secure our good will, when his heart was aching for the sights and the friends of his homeland.

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The New Mining Law of Colorado

For some time past the mining interests in Colorado have been wrestling with the question of revising the old mining law, which had become well-nigh obsolete, owing to the great development of the coal-mining industry in that state.

It was in November, 1910, that Gov. Shafroth appointed a commission to inquire into the condition of the coal mines, the causes of the many recent serious mine accidents, and to suggest remedial legislation. The commission consisted of Doctor Alderson, president of the State School of Mines; Doctor Ekeley, professor of chemistry, and R. D. George, professor of geology, both of the University of Colorado, the latter being also state geologist; and James Dalrymple, state inspector of coal mines.

The need of a new mining law in Colorado had been recognized for some time, but was emphasized by the re-

cent occurrence of two serious mine explosions; namely, the Starkville explosion, Oct. 8, 1910; and the explosion at Delagua, Nov. 8, 1910; the former costing 56 and the latter 79 lives. The work of the commission extended over a period of two years and has resulted in giving to Colorado a practically new mining code.

Under the new law, a board of examiners is to be chosen, each four years, beginning 1913. Sec. 5 of the new law reads as follows:

Section 5. Within 30 days after the passage of this act the governor shall notify one judge of each of three judicial districts in which coal mines are operated to make appointments as follows: Two of said judges shall each appoint one reputable coal miner of known experience and practice at the time, from his judicial district. The third judge shall appoint one reputable coal-mine owner, manager or other mine official, and the governor shall appoint a coal-mining engineer of like repute, experience and practice at the time, who shall constitute, together with the chief inspector of coal mines, a board of five examiners, who shall hold office until the third Tuesday of January, 1917. The duty of the examining board so appointed shall be to examine candidates for the position of chief inspector, deputy inspector and mine officials and perform such other duties as are provided for in this act. Provided, when examinations are held to examine candidates for the position of chief or deputy inspectors, the chief inspector shall not act as a member of the examining board, but the other four members of the examining board herein provided for shall select the fifth member to act instead of the chief inspector.

In the year 1917, on or before the third Tuesday of January, and every fourth year thereafter, a new board of examiners shall be appointed as herein provided. The appointment of members on the board of examiners shall be made from the said judicial districts in regular rotational order. Vacancies shall be filled in the same manner.

The section above quoted is unique in respect to the method outlined therein for the selection of the examining board, which board is charged with the duties of examining all candidates for the offices of chief and deputy mine inspectors, company mine examiners, mine foremen, assistant mine foremen and firebosses.

The law provides (Sec. 40) that the board "shall meet at places selected by them, immediately after the taking effect of this act and every two years thereafter, or oftener if necessary." While the new law does not seemingly compel the employment of shotfirers, a clause of the same section reads as follows:

Shotfirers shall pass an examination to be given by the chief inspector or deputy inspector on occasions when either of these officials shall be present at the mine where the applicant for the position of shotfirer is employed: Provided, that when there is no certificated shotfirer at any mine employing shotfirers, the mine foreman and fireboss may examine any applicant as to his fitness to fill the position of shotfirer, and, having been satisfied of such fitness, may employ him in that capacity until the next visit of the chief or deputy inspector.

As will be observed from the reading of Sec. 5, in the examination of candidates for the office of chief inspector, the incumbent of that office cannot act as a member of the examining board. In that case, the remaining four members are authorized to select a fifth person to act in place of the chief inspector, on the board. The law, however, does not specify, as it should, the qualifications of the person to be so chosen for this place.

The law provides (Sec. 10) that the examining board

shall certify to the governor the names and grades of all successful candidates; and (Sec. 11) that, from this list, the governor shall select and appoint as chief inspector of coal mines, "the applicant best qualified for the duties of that office." The wording of this section makes it possible for the governor to appoint the applicant "best qualified" for the position, according to his own judgment and regardless of the rating the applicant received in the examination.

The law further provides (Sec. 12) that the chief inspector shall select his own deputy inspectors from the list of successful candidates. As provided in Sec. 13 a certified list of candidates holds good for five years from the date of certification. There is required (Sec. 16) a rating of 85 per cent. for the office of chief inspector of coal mines, and 75 per cent. for deputy inspector of coal mines.

The law requires (Sec. 17) that each candidate for inspector be a citizen of the United States and of the state of Colorado, of temperate habits, good repute and personal integrity, 30 years of age, and have an experience of 12 years in working coal mines in the United States, at least eight years of which shall be in Colorado and three years immediately preceding his examination. In addition, candidates for chief inspector must show executive ability that would enable them to advise, direct and control the inspection staff. Sec. 41 limits the time of examination of candidates for office other than mine inspectors to 15 days for each two years.

It is to be regretted that Sec. 18 of the law compels the examining board to provide candidates with the mathematical formulas required in the answering of any question given by the board. Instead of giving the formula to be used, the candidate should be given a textbook and required to find his own formula, which would demonstrate his ability to work out such a question without other aid than that afforded by the textbook with which he is or should be familiar, and which he invariably uses in daily practice as a workman uses his tools.

COAL AGE has always claimed and still holds that candidates for any practical official position in mining should be granted, in examination, the use of any textbooks with which he is familiar and which he commonly uses in solving technical questions, in daily mine practice, in the office, or at home. The object of the examination should be to show a man's ability to work out such technical questions as the examining board see fit to ask, under the same conditions with which he is surrounded in daily practice.

Examiners should not require candidates to memorize formulas, constants and other data, which they themselves obtain by reference to textbooks. Neither should examiners give a formula in connection with the question asked, as this is a decided help to the candidate and in no way proves his ability to work out the question independently. There are many candidates who could readily answer the question when the formula is given, but who could not find the correct formula in a textbook, and these men have not the ability that should be required to pass the examination.

We do not advocate that textbooks should be used in all the sessions of an examination, but only in one or two sessions in which technical questions only should be asked.

Common-Sense Precautions

On page 45 of this issue, Anthony Barrett, an inside foreman employed by the Philadelphia & Reading Coal & Iron Co., has given a series of "Don'ts" which are worthy the attention of all mining men who are employed underground or who oversee those who work in the mines.

There is no doubt but that other experienced mine officials could supply additional precautions which would make this set of rules still more complete in the amount of ground covered. We, therefore, ask that COAL AGE readers write us, suggesting further precautions which we can embody in a final set of rules, to be distributed broadcast among mining companies.

✱

The Pennsylvania State Tax on Anthracite Coal

The new law recently signed by Governor Tener, providing for a tax on all the hard coal mined in the state of Pennsylvania is now in effect, and the large operators will immediately put out a new circular to which this extra cost will be added.

The law provides, in brief, a tax of $2\frac{1}{2}$ per cent. of the value at the mine of all the coal produced. On the basis of the September circular, the maximum quotations on anthracite, the increase on the prepared sizes will amount to between $8\frac{3}{4}$ c. and $10\frac{3}{8}$ c. per ton. On the steam grades the increase will be from $3\frac{3}{4}$ c. to $6\frac{1}{4}$ c. per ton. These increases are to be added to the regular circular by all the large companies, effective July 1. How outlying states will regard the proposition of carrying Pennsylvania's taxes remains to be seen.

✱

Simultaneous Coal Conventions

During the week beginning July 16, four of the editors of COAL AGE were compelled to be away at the same time, attending different coal meetings. The territory covered extended from Alabama to Lake Erie and as far west as Utah, and even though we were compelled to leave the stenographers and the "printer's devil" to get out the paper, we would not have complained had we felt the situation was properly handled. Such is not the case, however. Not only was it a physical impossibility for us to attend all of the meetings but it was also impracticable to devote sufficient space to them.

This latter is probably the most serious feature of all; scarcely any of the coal societies have sufficient means to provide for the publication of the different papers and discussions which take place, and so they are compelled to rely upon the coal press of the country. The coal journals, as a rule, appreciate the high value of these papers and are eager to publish them, but such matter cannot be delayed and must be printed immediately.

Nor are we alone in this complaint. Machinery houses have petitioned the order of Kokoal to request the different state associations to so arrange their dates in the future that demonstrators may cover the ground thoroughly and as economically as possible. Complaints are also general from coal men of all kinds. It is, therefore, to be sincerely hoped that some concerted action will be taken in this respect and that next year will not witness such an absurd congestion of meetings.

SOCIOLOGICAL DEPARTMENT

Sanitation in Mining Towns

By J. H. WHITE*

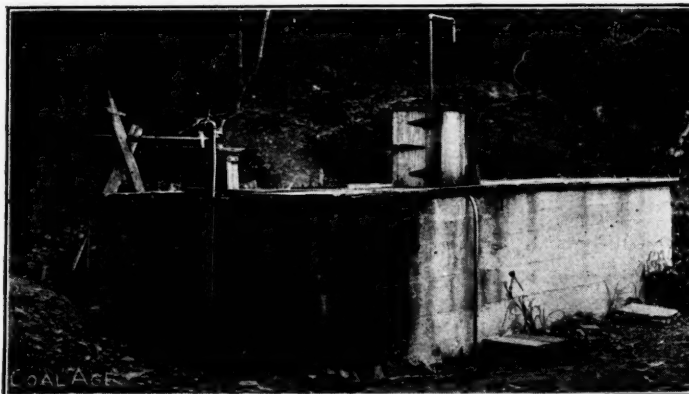
SYNOPSIS—Controlled entirely by the operator, with an income absolutely assured, so long as the mines work, the mining town can be made and kept sanitary if the ideal is borne in mind and the necessary expenditures made.

❖

The U. S. Bureau of Mines has recently incorporated a new section within its organization which is known as the Mine Sanitary Engineering Section, the function of which is to improve sanitary conditions in and about mines.

Perhaps the reason why sanitary improvements are

churches, schools, hospitals and the public utilities, such as the water supply and lighting system, are frequently owned and controlled by the operator of the mine. 2. The completion of the town at the time of its inception; it is a "made-to-order" product and is only occasionally the result of growth and development extending over a period of years. 3. The absence of permanency; the life of the average mining town is 20 or 25 years and the idea of abandonment at some time in the future is manifest. Modern mining towns are now being constructed with a longer life in view. 4. The pronounced similarity and sameness of the occupations of all the people residing in the town. 5. The absence of local self-government. 6. The dual capacity of landlord and employer vested in the same party.



Septic Tank at Edgewater, Ala., Mines



Protected Spring at Ishkooda, Ala.

TENNESSEE COAL, IRON & RAILROAD CO.

neglected and why people hesitate to spend money on them is because it is difficult to get an accurate measure of the returns on the investment. It is unfortunate that the results are not more tangible. You can install a meter and readily discover the slippage in a pump, or you can put an indicator on the steam chest of the engine and get a graphic presentation of the waste, and the prony brake on the pulleys will measure the loss due to friction, but you cannot calibrate humanity. We do possess an imperfect method, viz., vital statistics, but they are difficult and expensive to obtain, are subject to gross misinterpretation, and even when their story is told in the most graphic way they fail to drive the lesson home. Even epidemics arouse only local interest. The simple practice of learning from the experience of others is theoretical rather than real.

THE CHARACTERISTICS OF THE MINING TOWN

The characteristics of a typical mining town are:

1. Company ownership, the streets, lots, houses, stores,

Note—Abstract of address before the senior sanitary engineers, University of Pittsburgh, Pittsburgh, Penn., May 20, 1913. The photographs accompanying this article were kindly furnished by the Tennessee Coal, Iron & R.R. Co. to "Coal Age."

*Sanitary engineer, U. S. Bureau of Mines, Pittsburgh, Penn.

These conditions affect the following fundamental sanitary problems, among others:

1. Housing. 2. Water supply and disposal of waste. 3. The establishment and enforcement of sanitary rules and regulations.

As the mining town does not grow but is built at a single stroke, the valuable lessons learned by the "try-out" method and the profit gained by previous mistakes do not exert their powerful influence, so that the errors existing in one house exist in all. If one house is not properly lighted, all will be dark; if a few houses are placed too closely together, all houses will be similarly spaced; if there is congestion in one section, there will be congestion throughout; if one privy is unsanitary, all the privies will be the same. Of course, one could have learned from the experiences of other mining towns already built, but this information was perhaps not readily available and local conditions modify each case.

I believe you can see that the uniformity of occupation of the tenants has its effect upon the housing situation. While no two human beings are the same, none of us can deny that similar means of livelihood have marked effects upon our practices, habits, recreations and dress. This in a way simplifies the housing problem as it eliminates the variety of conditions and conveniences to be provided.

COMPANY TOWN A REFLECTION OF OPERATOR'S IDEALS

Company ownership is the most important factor entering into housing conditions. Every house reflects the standard which the operator wishes maintained; comparisons, variations and graduations are absent. It is difficult to stimulate personal pride among the inhabitants and no friendly rivalry exists. However, if improvements are introduced they are far-reaching, and the tone of the entire town is raised, so that one house does not point the finger of scorn at its neighbor. As the employer is also the landlord, the payment of rent is compulsory and the importance of an assured income should be given due weight.

In discussing the water-supply situation it must be kept in mind that the town site is generally determined by the location of the mine shaft which in turn is established by such factors as topographic conditions, formation of coal, economic transportation and similar commercial considerations. The necessity and importance of a satisfactory domestic water supply for the people who were to get out the coal was probably not given much consideration in the past; it is hoped that more thought will be given to this phase of mine development in the future. In some places the men are carried daily to the mine in work trains or by interurban tramroads, and numerous difficulties are thus avoided. In studying conditions with a view of introducing a public water supply into a town the cost of improvements and the age of the town must be carefully balanced. Another factor which may complicate the problem is the relatively large industrial consumption of water compared with the demands for domestic use. This may mean an extra large filter plant to purify all water (both domestic and industrial) or the installation of separate pumping and distribution systems. The possibility of piping water from a neighboring town may furnish a solution at certain places and its feasibility should always be investigated.

PROTECTION OF INDIVIDUAL WELLS

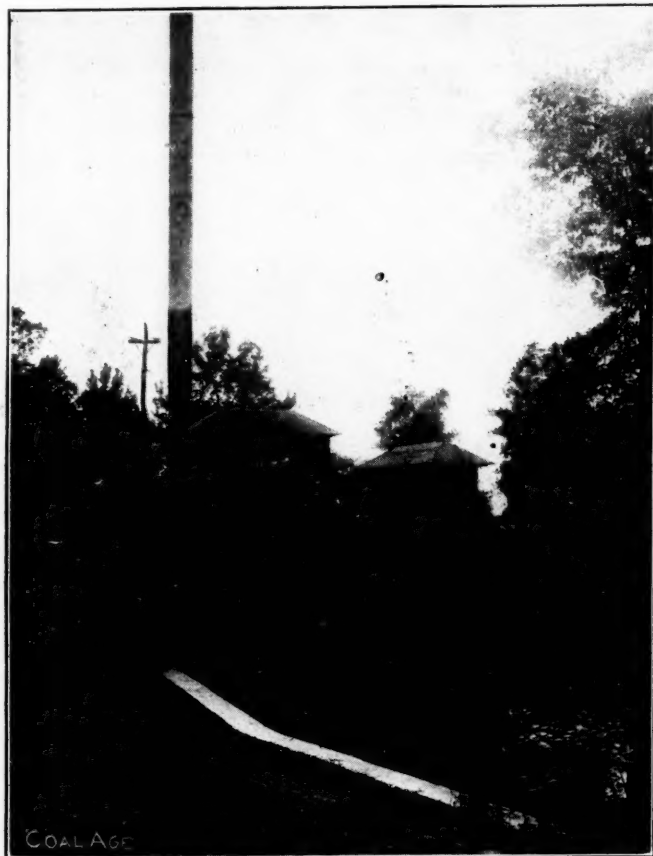
In many mining towns the domestic water supply is from individual wells, and while this system is far from perfection, it can be brought up to a safe standard. The usual indictment against the system is the susceptibility of the wells to infection, and on account of the inconvenience of drawing water an insufficient amount will be used for household and personal cleanliness. The danger of infection may be minimized by abolishing the unsanitary privies and conditions around a dug well may be improved by lining it with terra-cotta pipe, placing a water-tight covering of concrete over the top and installing a pump.

The nature of the soil plays an important part in the safety of the well, sandy soil furnishing a natural protection. In a limestone region pollution may come from points many miles away, which makes the potential danger of the well in such measures great. In such cases the distribution of drinking water in bottles throughout the town may be necessary, the well water being used for cooking and washing purposes only. The inconveniences due to the difficulty of getting water from the wells may be eliminated by establishing bath houses at the mine shaft so that the men may wash upon coming out of the mine. These bath and change houses are being widely introduced; in a few states they are required by law. A

public laundry is a great convenience for the women; lugging in several tubs of water preliminary to doing a week's washing is a severe burden. Bath houses in or near the schools for the women and children are almost necessary accessories to the perfect well system. Wholesome and safe drinking water is essential to existence; its supply is one of the gravest responsibilities accompanying company ownership.

SANITARY SEWERAGE

There are few mining towns with sanitary sewer systems and some of the statements already made explain their absence. Such a system presupposes a public water supply for flushing purposes, and all that has been said about



MOORE'S SPRING PUMPING STATION AT THE MINES OF THE T. C., I. & R.R. Co.

the difficulties of obtaining water bear indirectly upon the sewerage question. In the second place, the approximate location of the town site is determined by the mine shaft and the topography must be accepted as it is. This is generally rough and hilly and a single gravity system of sewers is almost impossible as the cost of leveling off the hills and grading the streets is prohibitive.

Moreover, a suitable stream to take the discharge of the sewers may not be near at hand; and the necessity of installing a sewage-disposal plant looms up. Besides these difficulties the expense of making house connections, installing plumbing fixtures and keeping these in repair means a large expenditure. In the construction of new towns, some of these objections could be avoided by a more careful selection of the town site and arranging streets so that they follow contours. In some cases, also, the experiment has been tried of building the outhouses or privies over the sewers and having a single automatic

flush which serves for a number of houses. This obviates expensive plumbing fixtures and cuts down the extravagant use of water.

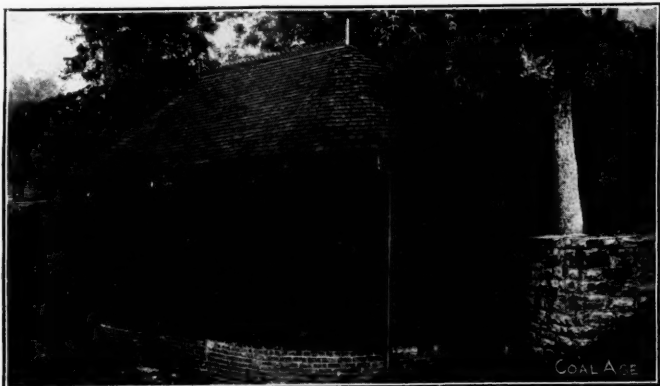
THE DRY CLOSET

At its very best the dry closet is not an institution to be proud of, and one would hesitate to estimate the sickness and loss of life caused by these neglected filth spots that abound in most every mining town.

A privy is sanitary when there are: (1) No nuisances surrounding it. (2) No possibility of ground pollution or infection of water supply. (3) No possibility of the spreading of germs by flies or other insects or animals.

The ground pollution and water infection is eliminated by the water-tight receptacle, but it is difficult to shut out flies. Methods used are darkening the vault, covering each deposit with sand, clay or ashes, placing a strong deodorant in the cans, or possibly partly filling the cans with water so as to cause an immersion of the stools. It is seldom possible to depend on fly-tight construction.

The sanitary collection and disposal of night soil is another important feature and one which has not been satisfactorily solved. It is almost impossible and practically uneconomical to destroy this material by fire. Disinfection by a liquid is not efficient because of the impermeability of the solid matter and the nauseating work of bringing about a thorough mixture by stirring. Burying in



MOORE'S SPRING, CONCRETED, BRICKED AND HOUSED,
T. C., I. & R.R. Co.

the ground is not without its drawbacks because of the pollution of water supplies and because in the development of the fly larvæ, disease germs may be brought up from several feet under the surface. One method which is being tried is placing this material in a septic tank and promoting liquefaction of the solid matters by various agencies in the tank and then applying a liquid disinfectant to the effluent. This method is being tried out by one of the large mining companies of Alabama.

The collection of garbage, trash and waste of all kinds offers no special difficulties. There is a surprisingly small amount of this and the hens, hogs and dogs usually consume it.

The establishment and enforcement of health laws and regulations in mining towns vary markedly from those in other places. Company ownership expedites the legislation and simplifies the enforcement. The official sanitary inspector is in absolute control and he need be retained, however, only as long as he does his work satisfactorily.

It is not necessary for him to cater to any particular parties or show any favoritism or partisanship, as his job does not depend upon his popularity. The dual capacity of landlord and employer commands obedience to the laws as their violation may be punished by discharge and eviction from the town. On account of similarity of occupations the regulations will affect all the inhabitants with the same severity and one class is not discommoded for the benefit of another—as, for instance, in a city where stable regulations and permits bring neighbors into conflicts.

ON THE OPERATOR DEPENDS THE CONDITION OF THE MINING TOWN

These are the advantages that mining towns possess, but the drawback lies in the fact that the initiative in maintaining sanitary and clean conditions throughout the



PUMP AT BAYVIEW, A MINING CAMP OF T. C., I. & R.R.
Co., NOW UNDER CONSTRUCTION

mining town rests entirely with the operator. Indifference on his part may give rise to deplorable sanitary conditions. The residents have no official voice in the government of the town and unofficial aggressiveness is seldom exerted because the total absence of property rights breeds irresponsibility and carelessness. Most of them are blissfully ignorant of the dangers of unsanitary surroundings, and when they protest it is the inconvenience rather than the dangers that bestir them.

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Company Schools at Gary, W. Va.

J. F. Drummond, of Huntington, W. Va., has been engaged in starting schools for workingmen at Gary, W. Va. There are night schools at all the mines of the United States Coal and Coke Co., and these schools educated on an average 25 men each. The education is not occupational, but is designed to teach the men to speak, read and write the English language. Text books are lent by the company to the pupils. They can buy them, if they so desire, but unless they spend money in this way, attendance at school is absolutely without expense to those availing themselves of the instruction.

INQUIRIES OF GENERAL INTEREST

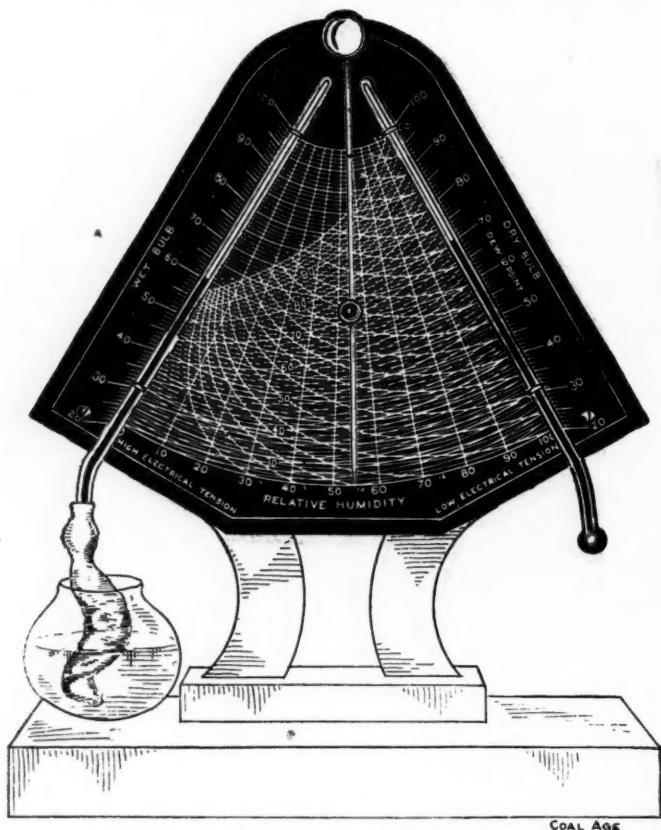
A Humidity Chart

Will you kindly state if there is a chart for determining the percentage of humidity in the air directly, without calculation; and also explain the method of calculating the percentage of humidity from the readings of the dry- and wet-bulb thermometers?

J. S. WATSON.

Baxter, W. Va.

In reply to this inquiry, we would say that the only chart of which we have any knowledge is that known as the "hygrodeik chart," prepared some years ago from corrected tables of the U. S. Weather Bureau. The chart



THE HYGRODEIK

has since been used in connection with the hygrodeik instrument shown in the accompanying figure, and designed by the Taylor Instrument Co., Rochester, N. Y.

The operation of the instrument is exceedingly simple. A pointer, or index finger, is arranged to slide up and down on a movable arm. First, the arm is swung to the left and the pointer moved to correspond to the temperature of the wet-bulb thermometer, which, in this case, is 60 deg. F. The arm is then swung to the right until the pointer intersects the curved line terminating in the reading of the dry-bulb thermometer, which, in this case, is 70 deg. F. The lower extremity of the swinging arm then points to the relative humidity of the air, which is read, in percentage, from the lower scale of the chart and is, in this case, 55 per cent.

The lines that curve downward to the right show both the weight of moisture in the air and the dew point or temperature at which that moisture would fully saturate the air. In the present case (wet bulb, 60°; dry bulb, 70° F.) the dew point is 52 deg. F., and the amount of moisture present in the air 4.4 grains per cubic foot. This amount of moisture would fully saturate the air at 52 deg., but gives only 55 per cent., humidity at 70 deg. F.

The principle of the hygrometer is generally well understood. The two thermometers are identical, with the exception that the wet-bulb thermometer, shown on the left, is covered with a fine silk or cotton sack, terminating in a wick, which dips into the small water vessel shown below. The water is drawn up through the wick by capillary attraction and keeps the sack moist. The evaporation of the water from the sack increases with the dryness of the atmosphere. The evaporation is most rapid in a perfectly dry atmosphere and ceases altogether when the air is fully saturated with moisture.

The principle involved is that the evaporation of the water causes an absorption of heat, which cools the wet bulb and reduces the reading of this thermometer. The reading of the dry-bulb thermometer indicates the actual temperature of the air.

THE CALCULATION OF RELATIVE HUMIDITY

In order to calculate the relative humidity of the atmosphere from the readings of the dry- and wet-bulb thermometers, it is necessary, first, to obtain from a table, the tension of aqueous vapor, expressed in inches of mercury, for each of the temperatures indicated. Then, divide the difference of the readings of the dry- and wet-bulb thermometers by 88, for all temperatures of the air above 32 deg. F. (For temperatures below 32 deg. F., divide the difference of the readings by 96.) Multiply the result by the observed barometric pressure divided by 30. Subtract this last result from the tension of the aqueous vapor at the lower temperature (wet bulb), and divide the remainder by the tension of the aqueous vapor at the higher temperature (dry bulb). The quotient thus obtained will be the relative humidity of the air expressed as a decimal.

Calling the dry- and wet-bulb readings (Fahr.) t_d and t_w , respectively, the corresponding tensions of the aqueous vapor expressed in inches of mercury P_d and P_w , and the barometric pressure B , the relative humidity of the atmosphere (H) is expressed by the formula:

$$H = \frac{P_w - \frac{B}{30} \left(\frac{t_d - t_w}{88} \right)}{P_d}$$

Making the calculation for the above readings, since $P_d = 0.7335$; and $P_w = 0.5183$, assuming a barometric pressure $B = 30$ in., the humidity of the air is

$$H = \frac{0.5183 - \frac{30}{30} \left(\frac{70 - 60}{88} \right)}{0.7335} = 0.55, \text{ or } 55 \text{ per cent.}$$

DISCUSSION BY READERS

Mixed Lights in Mining

Letter No. 4—That the discussion of the question of the use of mixed lights in coal mining is one of great interest to both miners and officials alike, cannot be doubted. The question, however, will appeal differently to men working under different conditions, as they will view it, each, from a different standpoint. A discussion of the question, nevertheless, will develop many practical points that will be of benefit to all classes and help to safeguard human life and property in and about the mines.

In deep coal mines, where the coal is giving off large quantities of gas, there is no question but that safety lamps should be used exclusively, for the reason that a slight accident or derangement of the ventilating system would soon reduce the mine air to a point where it would be highly explosive; and such an occurrence would not be anticipated in time to avert an accident. In working mines of less depth, or generating less gas, however, it is not generally considered necessary to use safety lamps, especially if the ventilation in the mine is good and there is but a small percentage of gas in the return current.

In the class of mines last mentioned, it frequently occurs that a single heading or an isolated working place that has been driven up a considerable distance, becomes difficult to ventilate; and the lamp may show a slight cap in a cavity of the roof or close to the face of the coal. In working such a place, it would be agreed quite generally that safety lamps should be used. It does not seem necessary, however, that a whole section of the mine should be put on safety lamps, because one or two working places in it require their use. In my opinion, it is out of all reason to demand that such a section shall be worked exclusively on safety lamps. It must be remembered that both miners and mine laborers are more liable to injury where safety lamps are used than where they are allowed to use open lights; provided, of course, that the conditions are such as to make open lights safe.

In closing, permit me to say that I believe it is a detriment to all concerned to oblige the use of safety lamps throughout a section where the conditions requiring their use are not general; or, in any case where their use can be avoided with reasonable safety.

W. J.

Ladysmith, B. C., Canada.

Letter No. 5—I do not consider it good practice to use mixed lights in a mine that is making gas in sufficient quantity to render an explosion possible. This conclusion, I believe, is justified from the fact that all persons, foremen, company hands and miners alike are careless and forgetful, or absent-minded, as the case may be. Many instances can be given that demonstrate the truth of this fact.

Suppose, for example, that gas is reported in one or more chambers on a gangway, in a certain mine, and a bratticeman is sent in to remove the danger. He will

generally take a safety lamp and a naked light with him; and, setting his naked light down on the bottom rock in the intake, he proceeds to erect a brattice for the purpose of driving the gas from the face of the pitch. Everything goes well until some unforeseen occurrence drives the gas down on the open light, and there is an explosion in which the bratticeman is badly burned and sometimes others suffer with him.

I recall several small explosions that occurred in about this way. In one case, I was driving a mule and running cars to make up the trip. It was our custom to use naked lights to a certain point; but it was necessary to use safety lamps when gathering the cars for the trip. When the trip was made up ready to run to the foot of the shaft, we would put our naked lights on our heads, so as to be ready to sprag the trip. It frequently happened that we would forget we had a light on our head and step back past the danger point. In this manner, I had two mules burned and was myself nearly suffocated with the afterdamp. The night driver and several others were badly burned, in this way, at the same place.

In another instance, I recall, the mine officials were watching the removal of a body of gas. About an hour later, when it was supposed that all the gas had been driven out and the place was safe, a man was badly burned. In this case, also, mixed lights were used.

When we consider that these and similar accidents are happening frequently, we are forced to conclude that, although it is more convenient to work with an open light than with a safety lamp, yet for the good of all concerned, the use of open lights should be prohibited in a mine generating gas in sufficient quantity to cause an explosion.

A mine laid out and equipped in the best manner possible and having an efficient system of ventilation is not exempt from danger, even when safety lamps are used, if a few men are allowed to carry open lights. A moment's absent-mindedness or the carelessness of a single man with an open light may be the innocent cause of untold suffering; and to avoid this, no mixed lights should be used in any mine generating gas in dangerous quantity.

A MINER.

Scranton, Penn.

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Safety Lamp and the Eyesight

I do not think it wise to allow Mr. Sutton's letter on the effect of safety lamps on the eyesight, *COAL AGE*, June 28, p. 1008, to pass without comment. The letter as it stands is liable to mislead many persons who are not better informed. I may say, at the outset, that I have known miners who have had over 30 years' experience with safety lamps and whose eyesight was not apparently affected in the least degree. This, however, does not warrant the conclusion that the continued use of such lamps **does not affect** the eyesight of others.

Anyone who doubts the harmful effect of safety lamps on some eyes should visit a mining locality where safety lamps have been used almost exclusively for a number of years. In such a locality, it will soon appear to an unprejudiced mind that the disease known as "nystagmus" is uncommonly prevalent. That its cause is directly traceable to the continuous use of the safety lamp has been claimed by eminent oculists (COAL AGE, Vol. 1, p. 1215). The observant visitor, in such localities, will notice that many whom they meet, habitually tilt their heads backward in order to obtain a better vision of objects or to enable them to recognize persons better. The reason for this is that the disease produces a rapid oscillation in the eyeball that blurs the sight. The effect is more noticeable at twilight when a person so affected has greater difficulty to recognize objects clearly, than at midday.

As showing the generally defective eyesight of firebosses I may quote an item from COAL AGE, Vol. 1, p. 352, which reads as follows:

The necessity of periodical medical examination of the eyes of firebosses is shown by the results of such examinations conducted at the Globe colliery, Wales, England. After a disastrous explosion caused by shortfiring in a gassy chamber, it was found there was 3 to 3½ per cent. of firedamp present, which was not detected by the fireboss because of his defective eyesight; the examinations clearly showed that out of 41 firebosses inspected by a government inspector, 31 were found to have defective eyesight.

This is truly a large percentage of defective eyes, among men who were charged with the duty of examining the safety lamps of miners and detecting gas by observing the scarcely visible flame cap in a lamp. The peculiar conditions to which the eyes of all firebosses are exposed have convinced me that the continued use of the safety lamp is not without injury to the eyes of a large class of miners.

I am not writing this for the purpose of condemning the use of safety lamps. In many mines, the use of safeties is a necessary evil and will continue as such until something is found to take its place. Even where electric lamps are used a safety lamp must be employed to test the air. I think that everyone using safety lamps should know that the use of the lamp is liable to affect his eyesight, in time, so that he can use every precaution to avoid this danger. Having this knowledge, the careful miner will hang his lamp where its light will not fall directly on his eyes. He will also avoid the bad practice of holding the lamp in his teeth while driving a wedge or doing similar work. Not only are the eyes exposed to the fumes of the lamp when so held, but its position causes a squint.

W. L. MORGAN,

Mine Inspector, 8th District.

East St. Louis, Ill.

Study Course in Coal Mining

By J. T. BEARD

The Coal Age Pocket Book

ESTIMATION OF COAL LANDS

It is common to estimate the value of coal land on a basis of the weight of coal underlying an acre. To determine this with any degree of accuracy, the land must first be thoroughly prospected with a diamond core drill to determine the average thickness of the seam.

The burning or coking quality of the coal can only be determined by actual practical test when the coal is mined, although the core samples taken from the drill holes enable a fair judgment to be formed in respect to the probable value of the underlying coal.

The records of the prospect holes must also show the condition and character of the various strata overlying and underlying the coal, the thickness and inclination of the seams, the amount of water that may be expected when sinking shaft or slope, the position and general direction of any fault lines that may be present and other data of interest in mining.

A common rule for estimating the ton-acre value of a level seam of coal, allowing about one-third for screenings and waste was formerly:

Anthracite, 100 tons per inch-acre;
Bituminous, 1000 tons per foot-acre.

Owing, however, to improved methods of mining, and to changes in the relative amount and value of the screenings, these rules are practically obsolete. The present custom is to calculate the cubic contents of the seam, and the corresponding weight of coal, knowing its specific gravity. The following table has been computed for anthracite coal of 1.5 specific gravity.

TABLE I—TONS OF COAL UNDER ONE ACRE OF SURFACE
Calculated for a Specific Gravity of 1.50 or 93.7 lb. per cubic foot

SEAM THICKNESS IN FEET	ONE FT.	TWO FT.	THREE FT.	FOUR FT.	FIVE FT.	SIX FT.	SEVEN FT.	EIGHT FT.	NINE FT.	TEN FT.
10	194.51	389.01	583.51	778.01	972.51	1167.01	1361.51	1556.01	1750.51	1945.01
9	175.05	350.10	525.15	700.20	875.25	1050.30	1225.35	1400.40	1575.45	1750.50
8	155.60	311.20	466.80	622.40	778.00	933.60	1089.20	1244.80	1400.40	1556.00
7	136.15	272.30	408.45	544.60	680.75	816.90	953.05	1089.20	1225.35	1361.50
6	116.70	233.40	350.10	466.80	583.50	700.20	816.90	933.60	1050.30	1167.00
5	97.25	194.50	291.75	389.00	486.25	583.50	680.75	778.00	875.25	972.50
4	77.80	155.60	233.40	311.20	389.00	466.80	544.60	622.40	700.20	778.00
3	58.35	116.70	175.05	233.40	291.75	350.10	408.45	466.80	525.15	583.50
2	38.90	77.80	116.70	155.60	194.50	233.40	272.30	311.20	350.10	389.00
1	19.45	38.90	58.35	77.80	97.25	116.70	136.15	155.60	175.05	194.50

The top horizontal column of TABLE I, gives the thickness of coal seam up to ten feet. The extreme left-hand column shows inches. For example: to find the number of tons of coal in a 10-acre tract, where the seam has a thickness of 2 ft. 6 in. run down the 2 ft. column until opposite 6 in. and you will find 455.740. Multiply by 10 and the result is 4557.40 long tons.

For inclined seams, it is necessary to divide the values in this table by the cosine of the angle of inclination of the seam.

To find the weight in long tons for a coal of any specific gravity other than 1.5 "it is only necessary to multiply the figures shown in these tables by the ratio of the given specific gravity to 1.50.
For Example: The weight of coal underlying a 10-acre tract when the seam is flat, 2 ft. 6 in. thick, and the specific gravity of the coal 1.30 (Bituminous) is 455.740 x .8666 = 395.112 or 395 long tons.
On a pitch of 60 deg. this seam would contain double this amount or practically 79,000 long tons. Expressed in short tons, these amounts should be 455.740 x 2 = 911.480 or 911 short tons.

COAL AGE

The Coal Age Pocket Book

To Calculate the Lower Inflammable Limit—In order to calculate the proportion of gas (methane) and air when the firedamp mixture first becomes inflammable, it must be assumed that all the heat generated by the combustion of the gas is absorbed by the products of the combustion and the remaining unburned air. Owing, however, to there being a certain amount of heat lost by radiation or otherwise that cannot be estimated or accounted for, the calculated inflammable limit will only approach the actual, to the extent that the conditions are fully realized in the calculation. The process is as follows:

The weight of oxygen necessary to burn 1 lb. CH₄ is shown by the relative weights of these gases in the reaction:

	CH ₄ + 2 O ₂ = CO ₂ + 2 H ₂ O			
Molecular weights,	16	64	44	36
Relative weights,	1	4	2½	2½

But oxygen forms 23 per cent., by weight, of the air, the remaining 77 per cent. being practically all nitrogen. The weight of nitrogen concerned in burning 1 lb. CH₄ in air is then calculated as follows:

$$23 : 77 :: 4 : N$$

$$\text{and } N = \frac{77 \times 4}{23} = 13.39 \text{ lb.}$$

From a table giving the heat of combustion of different substances, it is found that 1 lb. CH₄, burned in air or oxygen, gives out 23,513 heat units (B.t.u.). The temperature of ignition of this gas (CH₄) is 1200° F.

Now, since the specific heat of a substance is the heat (B.t.u.) absorbed by 1 lb. of that substance, during a rise of 1 deg. F. in its temperature, the heat absorbed by the products of combustion of 1 lb. CH₄, for each degree rise in temperature, is found by multiplying the specific heat of each of the products, including the nitrogen of the air, by the relative weight of each product, respectively. The total heat is then found by multiplying that result by the number of degrees rise in temperature; and adding the latent heat in the steam or water vapor, as follows:

The specific heats of the several products of combustion, referred to water as unity (1), are carbon dioxide, 0.2163; nitrogen, 0.2438; water vapor, 0.4805; and air, 0.2374. The latent heat of the water vapor (steam) or the heat absorbed when 1 lb. H₂O becomes steam at 212° F. is 966 B.t.u. The heat absorbed by the products of combustion, for a rise of 1200 — 32 = 1168° F., is therefore

Carbon dioxide,	0.2163 × 2.75 × 1168 =	694.7264
Nitrogen,	0.2438 × 13.39 × 1168 =	3812.9360
		4507.6624 B.t.u.
Water,	1.0000 × 2.25 × 180 =	405.0000
Latent heat,	966.0000 × 2.25 =	2173.5000
Water vapor,	0.4805 × 2.25 × 988 =	1068.1515
		3646.6515 B.t.u.

Total heat absorbed by products.....8154.3139 B.t.u.

EXAMINATION QUESTIONS

British Columbia, First-Class Candidates, May 27, 1913

(Selected Questions)

Ques.—(a) State the conditions under which mine explosions are most frequently produced. (b) In what way do various kinds of coal dust influence the character of an explosion?

Ans.—(a) Mine explosions most frequently occur in a dry and dusty mine generating gas in small quantities, so that it is not considered necessary to use safety lamps except in a few places in the mine where the gas is more troublesome than elsewhere. Under these circumstances, a good ventilating current is commonly maintained in quantities that is deemed sufficient to make the working places safe.

Too much reliance is often placed on the proper arrangement of brattices and the enforcement of mine regulations with respect to gas, dust and lamps. A brief derangement of the ventilating current from any cause, or an unexpected fall of roof in an unused chamber where gas has accumulated, or the failure on the part of any workman to comply with the regulations, or the carelessness or absent-mindedness of an employee may cause the ignition of gas and produce disaster.

(b) The degree of inflammability of coal dust and its fineness increases both the liability to explosion and the energy developed when the dust is ignited by a flame of sufficient volume and intensity. The suspension of the fine dust in the air current or in the atmosphere of the mine workings renders it more susceptible to ignition. The dust of soft coal, bituminous or semibituminous, is generally more inflammable than that of harder coal. The dust of anthracite coal is not inflammable under ordinary conditions, but may add to and intensify what would otherwise be only a gas explosion.

Ques.—If the specific gravity of marsh gas is 0.559, what will 100 cu.ft. of this gas weigh, at a temperature of 60 deg. F., barometer 30 in.?

Ans.—The weight of this gas is calculated thus:

$$W = 100 \times 0.559 \frac{1.3273 \times 30}{460 + 60} = 4.28 \text{ lb.}$$

Ques.—Explain the law of diffusion of gases and its effect on their behavior in mines. Give rule and example, showing how to find the comparative velocity of the diffusion of the different gases.

Ans.—The molecules of all gases and air are in a state of constant vibration. The amplitude of the vibration or the distance through which the molecules vibrate depends largely on the density of the gas. When two gases, or a gas and air of different densities are in contact, the vibratory motion of the molecules at the plane of contact is not equal for the two mediums; and, as a result, there is a constant progression of the molecules of one of the gases into those of the other, causing them to mix or intermingle. The action is called "diffusion" and is very

rapid. The effect of the diffusion of gases, in mines, is to cause them to mix with the air and with each other, in varying proportions.

The velocity, or rate of diffusion, of air and gases into each other varies inversely as the square root of their densities. For example, calling the density or specific gravity of air 1 and that of methane or marsh gas (CH_4) 0.559, the ratio of their velocities of diffusion is

$$\frac{V_{\text{air}}}{V_{\text{gas}}} = \sqrt{\frac{0.559}{1}} = \frac{0.7476}{1}; \text{ or, say } \frac{3}{4}$$

This shows that in the diffusion of marsh gas into air, the relative velocities of the air and the gas are as 3:4. That is to say, for every three volumes of air passing into the gas, there are four volumes of gas passing into the air.

Ques.—(a) How many cubic feet of air should be mixed with 1 cu.ft. of firedamp to render it harmless? (b) What percentage of firedamp is the most dangerous?

Ans.—(a) The proportion of gas and air that may be considered as the safe limit will depend primarily on the nature of the gas or gases present, the quantity, fineness, and inflammability of the dust suspended in the air; and the character of the coal, size of openings and method of working. In the working of bituminous coal, under ordinary mining conditions, there should be from 100 to 150 cu.ft. of air for every cubic foot of explosive gas. In the working of anthracite coal, under ordinary mining conditions, from 40 to 65 cu.ft. of air for every cubic foot of explosive gas is sufficient to render the mine air safe for working.

(b) When marsh gas (CH_4) is present in any proportion in excess of the upper or higher explosive or inflammable limit, the mixture may be considered as more dangerous than where the proportion of gas to air is less. The reason for this is that any addition of air, which is liable to occur at any time or place in the operation of the mine, may render the mixture highly explosive. The less dangerous mixtures are those in which the proportion of gas to air is less than that required for the maximum explosive force, or one volume of gas to 9.57 volumes of air. In this case, any addition of air renders the mixture less explosive.

Ques.—In a mine giving off 2500 cu.ft. of marsh gas per minute, the volume of air entering the intake opening is 4,500,000 cu.ft. per hr.; what is the percentage of gas in the return current? Would you consider this percentage of gas dangerous?

Ans.—In this case, the volume of air passing is $4,500,000 \div 60 = 75,000$ cu.ft. per min. Assuming there is no increase of the volume of air on the return, due to a rise of temperature or a fall of ventilating pressure, the volume of the return current is $75,000 + 2500 = 77,500$ cu.ft. per min. The percentage of gas in the return current, under many conditions, would be dangerous; it is

$$\frac{2500 \times 100}{77,500} = 2.3 \text{ per cent.}$$

COAL AND COKE NEWS

Harrisburg, Penn.

The Kline bill which provides for the coöperation of the state of Pennsylvania in the establishment of a Mining Experiment Station for investigations with a view of better safeguarding the lives of miners and greater efficiency in the mining and mineral industries and making an appropriation for the same has passed both houses of the legislature and is now in the hands of the governor for his signature.

The bill gives the governor the authority to appoint a commission of three, one of whom shall be the dean of the school of mines of the Pennsylvania State College, one the chief of the Department of Mines of Pennsylvania and one a practical miner. It shall be the duty of the Commission to coöperate with the director or other representative of the U. S. Bureau of Mines in the establishment in the state of Pennsylvania of a mining experiment station for the purpose of conducting investigations and making tests to better safeguard the lives of miners and to bring about greater efficiency in the mining and mineral industries. The members of the commission are to serve without compensation, but their actual expenses are to be paid.

For the prosecution of this work the sum of \$50,000 or as much thereof as may be necessary is appropriated.

The Commission is to submit to the governor as he may require reports giving the results of its work and shall arrange for the prompt transmission to the Department of Mines and to the Topographic and Geological Survey of the state copies of all reports, circulars, bulletins and other publications issued from time to time embodying the results of the tests and investigations conducted.

PENNSYLVANIA

Anthracite

Lykens—A. F. Hanna announces that he has discovered a new vein of coal in Broad Mountain after drilling 60 ft.

Hazleton—The abandoned workings on the outskirts of West Hazleton, which were formerly owned by James G. Harvey, are to be reopened. The projectors are the Nazareth Coal Co., a subsidiary of a cement company of the same name. Arrangements are now being made to sink a shaft.

Pottsville—Concerted antagonism of the legal advisers of the big coal companies to the enforcement of the bill placing a tax on anthracite is expected in the near future. The coal company officials claim that this measure is special legislation and has other unconstitutional features which will cause the higher courts to nullify the statute.

Lansford—The Lehigh Coal & Navigation Co. has offered to continue the wages of any of its employees who may enlist in the National Guard during such time as they are absent on duty and has also set aside a fund to encourage enlistments.

Wilkes-Barre—Eighteen hundred men went on strike July 1 at the Stanton colliery of the Lehigh & Wilkes-Barre Coal Co., when a number of employees reported without their Union buttons and failed to bring their dues to the locals of the miners' organization.

Brockton—On July 15, at 1:30 p.m., William S. Leib will sell at public auction in Brockton, Schuylkill County, Penn., the lease given and executed by Benjamin Smith Lyman and Frank Lyman to the Schuylkill-Lehigh Coal Co., dated Apr. 18, 1911; also the lease given and executed by the Philadelphia & Reading Coal & Iron Co., to the Schuylkill-Lehigh Coal Co., dated Apr. 18, 1911, together with the locomotives, steel and wood cars, hoisting engines, boilers, mine fans, jigs, coal breaker, machinery, tools, and all other personal property of the said Schuylkill-Lehigh Coal Co. now in the possession of the said receiver. This sale will be made subject to the mortgage given and executed by the Schuylkill-Lehigh Coal Co. to the Newark Trust Co. dated Oct. 17, 1911.

Bituminous

Clearfield—The Pennsylvania Supreme Court has sustained the Clearfield County Court in what are known as the discrimination cases brought by coal operators to recover damages from the Pennsylvania R.R. Co., on account

of illegal favoritism shown to competitors of the complaining operators in matters of coal car distribution. Verdicts against the railroad company were recorded in large aggregate amounts.

Kaylor—With new officers in charge, financial assistance assured and no debts, the property of the Great Lakes Coal Co. will hereafter be known as the North Penn Coal Co. The Great Lakes Coal Co. was bought at foreclosure sale last month by a committee representing the bond holders, practically all of whom have deposited their certificates. The property owned includes 20,000 acres of coal land in Butler and Armstrong counties, on which there are four mines one of which is being operated on a six months' lease.

New Bethlehem—A deal whereby the Pine Run Coal Co., of New Bethlehem, takes over the Cobaugh collieries property has been consummated, and the Pine Run Co. will begin at once to rebuild the railroad from Hawthorne and develop three mines on their property. The new territory has several cannel coal seams and three beds of soft coal already opened, all of which are on the Armstrong county side of Red Bank.

Cookport—Property owners in and about Cookport have, within the past few days, received notices of the acceptance of options taken some time ago. With these notices it is known for the first time definitely who the real purchaser is. The money is being paid out by the Manor Real Estate & Trust Co., which has opened offices in Indiana.

Connellsville—A mine fall, which caused the surface to drop nearly 4 ft., not only cut off the gas supply of Connellsville for more than an hour on July 1, but temporarily crippled the Possum Run branch of the Pennsylvania R.R. The fall occurred in the Limestone Hill neighborhood at about 4 o'clock in the afternoon. Both the Davidson and Trotter workings are in this vicinity, and the main pipe line of the Fayette County Gas Co. from the West Virginia field was broken, cutting off the town's supply.

Indiana—While celebrating the nation's birthday by exploding dynamite caps in a shanty in which was stored 175 sticks of dynamite, two miners, both of whom recently became naturalized, were instantly killed at McIntyre when the dynamite exploded. Both men were Austrians employed by the Coal Run Mine Co., and were celebrating their naturalization and the Fourth of July at the expense of the company.

WEST VIRGINIA

Beckley—B. T. Phillips and L. C. Lilly have leased the Worley mine from the Raleigh Coal Co., and will shortly be ready for the operation of the same. This mine was formerly operated by M. G. Quesenberry, but has for some time been idle.

Parkersburg—After ten years' contest in various tribunals, the Supreme Court has awarded Edward Grinnell, a mining engineer, between \$100,000 and \$200,000 as his net share of the proceeds of a sale of 60,000 acres of coal land in West Virginia.

Fayetteville—Following the purchase of the Manufacturers and Consumers Coal Co. lease at Fayette, by his agent, D. A. Thomas, the Welsh coal magnate, has been in Fayette county and gone over many of the properties on which these agents hold option. It is understood that several of these options may be closed within the next few days or weeks. It is also stated that additional options have been taken and cash forfeits put up to some of the Fayette operators.

Charleston—Civil actions which total \$40,000 will be claimed from the Paint Creek Collieries Co. by miners who were evicted from their homes on that company's property, under the term of what the miners call "the yellow dog contract." It is alleged that the evictions were made without due process of law and that the household effects of the miners were damaged when they were "dumped" on the ground.

An agreement has been reached between the New River miners and operators, and a strike thus avoided. By the terms of this contract, the miners are to have the privilege of organization, to receive semi-monthly pay, have a check weighman, have the privilege of dealing at independent stores, and work a nine-hour day. A conciliation board

composed of two miners and two operators who choose a fifth party to act as umpire, has been agreed upon and no Baldwin-Feltz guards are to be employed but such employees are to be replaced by a limited number of mine watchmen. Furthermore, all miners discharged for union activities may return to work and shall not be discriminated against.

KENTUCKY

Pineville—W. T. Caton, Edward Dunkin and Lester Lock, members of a first aid team of the Continental Coal Corporation, have each received from Major Chas. Lynch, U. S. A., a letter and check for heroic work in saving the life of Thaddeus Idol, a fellow workman in the mine. These prizes were the award of the American Red Cross Society and came from a donation made by former President Taft for the benefit of coal miners showing the greatest proficiency in first aid work. The men named are the first to receive a prize for actual first aid, in a mine in Kentucky. Teams from this company have won prizes in contests at Lexington and Pineville, and it would seem that they are equally efficient when the real emergency for which they are trained comes in the course of their everyday work.

The Elk Coal Co., operating on Greasy Creek, near Pineville, has leased its properties to the Corum-Parker Coal Co., of Pineville, which was recently organized for the purpose of taking over and operating the mines.

OHIO

Columbus—The first meeting of the Ohio Mining Commission appointed by Governor Cox to investigate the conditions surrounding the payment for coal mined in Ohio will be held in the State Chamber soon. An effort will be made to have the operators and miners state their side of the case and it will then be determined what trips will be necessary to gather information by the commission. It is expected that every mining district in the state will be visited.

Martinsburg—The Fairpoint Coal & Coke Co. owned by Wheeling parties, has leased its mine at Fairpoint to the Forest City Coal Co., which is operating a mine at Barnesville. F. L. Head, general manager of the Forest City Co., is now in charge of the Fairpoint property and is said to be planning improvements that will result in an increased production which means an increase in the number of employees.

Lancaster—Four Pittsburgh capitalists have secured a lease from the Zanesville Coal Co. on a 22-acre tract near the No. 3 mine in Perry County.

INDIANA

Petersburg—It is announced that Rootzell & Mackey, of Evansville, will reopen the Hartwell coal mines in the vicinity of Petersburg. For many years these mines were the largest in the vicinity, employing 300 to 400 men, and the new owners hope to bring them to their former productivity.

Representatives of the Vandalia Coal Co. have been taking leases on hundreds of acres of coal land southwest of this city on a line with the projected route from Bicknell to Evansville. Five thousand acres near Wheatland has been leased to the American Coal Co. said to be closely affiliated with the former firm.

Jasonville—A sample of coal from the farm of Julius Marvel has been tested by Edward Barrett, state geologist and pronounced a good grade of cannel coal. A survey will be made of the deposits.

Linton—A new shaft will be sunk at once one mile north of this city by a mining company headed by John Tempelton, of Terre Haute.

ILLINOIS

Duquoin—On July 1 a fire originating the coal chutes of the Paradise Coal Co., spanning the Illinois Central tracks, completely destroyed the company's buildings in the vicinity of the shaft mouth. An alarm was immediately sounded to the 300 or 400 miners below ground and the hoisting engineer, Charles Mathias, stood by his engine in spite of the intense heat until he had hoisted every man out of the mine. By this time his hands were blistered and his hair and eyebrows singed. At last accounts, although still alive, he was in a critical condition. Five other employees were seriously injured, but it is believed that they will recover. The estimated damages were \$50,000. The upper works will be rebuilt at once, the entire loss being covered by insurance.

Marion—The Illinois Hocking Washed Coal Co. took the bankruptcy act on account of the fire which is still burning in the mine it had leased from the Carterville District Coal

Co. J. C. Mitc'ell, cashier at the First National Bank of Marion, was appointed receiver. It is understood that some of the former officers and stockholders have organized another company known as the General Fuel and Power Co. to take over and handle the business formerly conducted by the Illinois Hocking Co.

Zeigler—The Interstate Commerce Commission has ruled that the allowance or division of rates which the Chicago, Zeigler & Gulf has been receiving from the Iron Mountain, Burlington and Illinois Central roads is unjust, discriminatory and unduly prejudiced against other coal mines served by the respondent. This is a case where the mining company owns about a mile of switching tracks connecting its mines with the three above mentioned railroads. These switching tracks are incorporated as Chicago, Zeigler & Gulf, and the mining company, since its incorporation, has been receiving a switching charge and other privileges which other mining companies have not been able to secure.

Hallidayboro—The Hallidayboro mine, which shut down May 1, will resume operations before the 15th of July. The mine is to be repaired and as soon as the repairs are complete, operation will begin. Nearly 300 men will be employed.

IOWA

Des Moines—Johnson Bros. mines near Clayworks will soon be running on electricity furnished by the Central Electrical Co. The Norwood White Coal Co., of Des Moines, have also let a contract to the same electrical company for the partial electrification of mines Nos. 4 and 9 near Yadres.

Prescott—Work at the prospect pit near here was stopped recently when a depth of 140 ft. was reached without finding coal. People who have examined the rocks in and near this pit have the opinion that a fault has been struck. Some are in favor of raising more money and drifting a few feet upon either side of the hole in the hope of reaching the coal.

ARKANSAS

Clarksville—All the mines in the Spadra anthracite coal-field were supposed to be in operation July 1. During the last season this field mined 90 per cent. more coal than the season preceding, and all indications point to a big run this year.

OKLAHOMA

Adamson—The Union Coal Co. has commenced opening mine No. 6 located one mile east of here, which, when completed, will be the largest in the Adamson territory. This company is building a large water reservoir, and a hundred houses to be occupied by the miners will be constructed in a few months.

WASHINGTON

Seattle—A struggle of almost a year to obtain from the Denny-Renton Co., better wages and conditions, as well as recognition of the union has recently resulted in a victory for the United Mine Workers. The above named company has leased its mine to the Pacific Coast Coal Co., which has been operating under a contract with the miners' organization in its several mines in this state. This lease is understood to be a withdrawal of opposition to the miners' organization on the part of the Denny-Renton Co.

FOREIGN NEWS

Brussels, Belgium—It has been announced by the Belgian Coke Syndicate that a reduction of 2 francs (39c.) per ton to all consumers who purchase during the rest of the current year will be made on coke July 1. This decision, upon the part of the manufacturers, is probably due to the comparatively poor condition of the iron market and to the stronger competition of German independent coke makers.

Vancouver, B. C.—Declaring that they have been induced under false pretensions to leave their native land, about 50 English coal miners have taken their case before Sir Wilfred Laurier, of Ottawa, asking that he request the Canadian Parliament to make an investigation. The men left England with the promise of better wages and also the assurance that there was no labor trouble ahead. Upon their arrival in Canada, they learned that the men in these collieries were on a strike, and many of them are absolutely destitute. The coal operators have evidently been put to a large expense with no apparent reward for their efforts.

Lima, Peru—Pressure is being brought to bear upon the Government in the hope of securing a subvention sufficiently

large to make possible the extension of the railroad from Sayan to the Oyon coalfield. It is understood that the Government is willing to bind itself to a certain amount of financial aid to a railroad or other private enterprise providing such company develops a stated tonnage of coal. This fuel would have to be mined at a price that would enable successful competition with foreign coal in the open markets on the Peruvian and Chilean coast. With the increasing use of fuel oil in the nitrate fields of Chile and the uncertainty of being able to compete with American coal after the Panama Canal is in operation, it is certain that great difficulties will be experienced in getting capital to invest at Oyon. On the other hand, it is claimed that the Peruvian navy must have a coaling station in the north of the republic and with the completion of the line to Oyon, plenty of coal could be furnished at Huacho. Regardless of the question of coal, it is said that a railroad to Goyllarisquisga would be a paying institution, as it would furnish a more direct outlet for the Cerro de Pasco production and would develop a rich territory.

PERSONALS

Fletcher W. Cunningham, of Charleroi, has succeeded Richard Maze as mine inspector of the 20th Bituminous District of Pennsylvania, with headquarters at Somerset.

Ramle S. Curtiss has been made manager of the offices of the Morgan Run Coal Co., which have been opened in the Boyd Building at Coshocton, Ohio, and are a branch of the Cleveland offices of the same company.

F. V. Nedden, of London, has recently taken a position as engineer in charge of the centrifugal pump department with the Goulds Manufacturing Co., of Seneca Falls, N. Y. Mr. Nedden has had a large and varied experience principally in Germany.

D. C. Botting, chief of the Washington state Coal Mine Inspection Department, has resigned and accepted a better position with the Government. He will take charge of the practical mining operations in the Matanuska coal fields of Alaska. His expedition will take out 800 tons of coal and test it upon a battleship.

A. S. Biesecker, who has been connected with the electrical department of the Delaware, Lackawanna & Western R.R. for the past eight years has accepted a position as electrical engineer for the Scranton Electric Construction Co. He will be succeeded by E. J. Powell, who, for some time past, has been his assistant.

Wm. B. Crawford has resigned as chief engineer of the Carter Coal Co. operating in West Virginia and Kentucky and will organize a firm of consulting and contracting engineers with headquarters in Bluefield, W. Va., and Chicago, Ill. The new firm will act as consulting engineers for several of the large coal corporations and will also do a general business as consulting engineers along civil, mining, mechanical and electrical lines.

W. L. Schmick, general manager of the Consolidated Coal Co., of St. Louis has resigned his position to accept a similar place with the Big Muddy Coal & Iron Co. It is understood that W. J. Jenkins, president of the Western Coal & Mining Co., will assume Mr. Schmick's duties with the Consolidated Coal Co. The Big Muddy Coal & Iron Co. is closely affiliated with the Gould interests which control the Western Coal & Mining Co., and the Consolidated Coal Co.

CONSTRUCTION NEWS

Pomeroy, Ohio—At an approximate cost of \$25,000 the Peacock Coal Co. has awarded a contract to the Roberts & Shaffer Co. for the building of a large steel tippie. In this structure the Marcus screen and picking conveyors will be employed.

Big Four, W. Va.—The Lake Superior Coal Co., successors to the Dixon-Pocahontas Coal Co., has a large force of carpenters at work erecting tenement houses for the miners. This operation is located near Big Four, just east of Welch.

Bluefield, W. Va.—Two miles of street car line connecting the towns of Northfork and Keystone, are said to be under construction. This is believed to be the first link of the long proposed electric railway between Bluefield and Welch.

Connellsville, Penn.—The Juniata Coal Co., of Bens Creek,

is making a new opening near the old mine and building a tramroad to deliver the coal to the railway. More surface has been leased preparatory to increasing the operations to a large scale.

Steubenville, Ohio—The Steubenville Coal & Mining Co. expects to have a new tippie in operation by the first of September. The structure will be of steel and will mechanically screen and grade all coal as it is dumped from a platform above the shaft.

Piedmont, W. Va.—The Consolidation Coal Co. is reopening the old Consolidation mine. A modern outfit for hauling, dumping and trackage is being installed. The branch railway, abandoned over thirty years ago, will be rebuilt. There are a number of coal beds still undeveloped within easy reach of three openings.

Grafton, W. Va.—S. A. Shackelford, Son & Co. have recently closed a contract with the Winona Coal & Coke Co., situated at Coffman, for the construction of 12 five-room dwelling houses. These will be two stories high and will be built in a row facing the railroad on a piece of level land just north of the old coke ovens and west of the present tippie.

Keeferton, W. Va.—The Roberts & Shaffer Co. have just closed a contract with W. W. Keefer, president of the Pittsburgh Terminal Railway and Coal Co., also of the Milburn Coal & Coke Co., for the building of a large steel tippie at Keeferton. The cost of this structure will be about \$30,000, and it will be equipped with the new Marcus combination screen and picking conveyor.

Joplin, Mo.—The Moka Coal Co. has commenced the stripping of the dirt and rock from a 160-acre tract of coal land near Mulberry. Prospecting has shown that it will be necessary to go to a depth of from 18 to 30 ft. to remove the coal. The railroad company will not be able to have a track built before the middle of July, but the coal company will proceed to uncover the coal and prepare it for shipment by that time.

Whitesburg, Ky.—It is reported that fine progress is being made on the Beaver Creek branch of the Chesapeake & Ohio R.R., from the mouth of Beaver to Steel's Creek, 22 miles distant. Hundreds of men and teams are employed on the work, and double shifts are being used. The Baltimore & Ohio is making preparations for the construction of its branch line in the same vicinity and will probably begin active work in a short time.

Whitesburg, Ky.—The Kentucky Coal & Timber Co., of which T. S. McGrath, of Chicago is the head, is taking steps to make good its recent announcement that it will develop its 30,000-acre holdings in Leslie, Perry and Letcher counties. Locations are being selected convenient to the railroad and grades prepared for the necessary sidings and switches. It will not be long before the company is ready to get out coal as the amount of construction work necessary is relatively small.

Wilkes-Barre, Penn.—The Delaware, Lackawanna and Western R.R. Co. are pushing the work on the elevated road to carry the coal from the Peach Orchard tract which is situated on the east side of the Susquehanna River to the Pettebone Colliery which is on the west side of the river.

From the Pettebone breaker an elevated track about 2000 ft. long and supported by 112 concrete piers and steel bents will connect with the old abandoned Wilkes-Barre and Eastern trestle (now owned by the Erie R.R. Co.) which crosses the river. The average height of the new trestle will be about 35 to 40 ft.

NEW INCORPORATIONS

Kansas City, Mo.—The Grey-Bryan Coal Co. has increased its capital from \$10,000 to \$30,000.

Indianapolis, Ind.—The Deep Vein Coal Co. of Terre Haute, has issued \$25,000 additional preferred stock.

Baltimore, Md.—The Hagan Coal & Coke Co., of Bristol, Va., has incorporated with a capital stock of \$100,000.

Indianapolis, Ind.—The Riverside Coal Co. has been incorporated here with a capital of \$10,000 by J. L. Hogan, F. G. Owen and F. Hollingsworth.

Louisville, Ky.—The Nebo Coal Co., of Louisville, has been organized with a capital stock of \$250,000. The company will handle properties in western Kentucky.

Briggs, Okla.—A charter has been granted to the Sequichie Mining Co. with a capital stock of \$1000. The incorporators are Geo. Pidgeon, Chas. Young and Coleman Dick.

Hazard, Ky.—The Ross-Petrey Coal Co. has been organized with a capital stock of \$5000. The incorporators are Alexander Ross, Lewis E. Petrey and W. J. Combs.

Wilmington, Del.—The Day Lumber and Coal Co. has been incorporated with a capital of \$1,000,000. The incorporators are S. E. Robertson, D. J. Jacobs, H. W. Davis, all of Wilmington.

Harrisburg, Penn.—The Dominion Coal Co. has been organized at Pittsburgh, with a capital stock of \$30,000. The incorporators are R. C. Mosten, B. A. Height, Herman F. Linnenbrink and R. S. McLean.

Little Rock, Ark.—The West Spadra Coal Co. has been granted a charter. The capital stock is \$25,000, of which \$4000 has been subscribed. The incorporators are R. D. Dunlap, E. W. Dunlap, C. Langford and W. R. Eustice.

Connellsville, Penn.—A charter of incorporation has been secured for the Rices' Landing Coal & Coke Co. by J. H. Price, Jr., C. C. Morrison and T. W. Stephens, all of Pittsburgh. The company will formally take over the property lately owned by the Dillworth Coal Co. at Rices' Landing.

Dover, Del.—Articles of incorporation were filed June 27 for the Yankee Development Co. of Pittsburgh, to acquire mineral lands of all kinds and prepare the same for market. The capital stock is \$100,000 and the incorporators are W. J. Hammond, Thos. G. Shields and C. M. Patterson; all of Pittsburgh, Penn.

Charleston, W. Va.—The Middle Fork Coal and Land Co. has been organized with a capital of \$20,000, principal office in Elkins and chief works in Randolph County, Middle Fork district. The incorporators are Howard Sutherland, Effie H. Sutherland, J. F. Strader, Beryl H. Strader, all of Elkins, Humboldt Yokum and Hattie M. Yokum, of Beverly.

INDUSTRIAL NEWS

Petersburg, Ind.—The Evansville Utilities Co. is preparing to furnish electricity to the Ayrshire mine, south of this city, for lighting and to operate the mining motors.

Sprinkle's Mills, Penn.—The Knoxdale Coal Co. has leased several farms in this vicinity and expects to begin testing the land in the near future. The upper Freeport vein is being sought.

Morgantown, W. Va.—Coke is being shipped from the Poland Coke Co.'s plant on Dunkard creek. Forty of the one hundred ovens which have been completed are now in operation.

Bluefield, W. Va.—E. T. Boswell, president of the Big Vein Coal Co., is going over some undeveloped coal land near Richland, Va., with the view of opening up a new operation in the Red Ash vein.

Pittsburgh, Penn.—It has been estimated that in the neighborhood of six thousand carloads of coal have been hauled over the Pittsburgh division of the Pennsylvania R.R. every day during the month of June.

New Orleans, La.—A contract for the supply of coal for the government dredges working in Southwest Pass, has been awarded the Monongahela River Consolidated Coal and Coke Co. The first delivery will be 12,000 tons.

Greensburg, Penn.—H. C. Davis, of Wilkensburg, has leased a number of unused coke ovens at the Boyer plant in Mt. Pleasant Township, and will develop a small tract of coal acquired some time ago from the R. K. Hissem interests.

Spokane, Wash.—Judge George Turner, of Spokane, has sold his coal railroad in Montana to J. H. Gardiner, of Clark County, Washington, for \$50,000. The road is 13 miles long and connects with the Northern Pacific tracks at the town of Chestnut.

Buffalo, N. Y.—The coal chutes and warehouses of the Peoples Coal Co., at Williamsville, near Buffalo, burned July 1, involving a loss of \$10,000. About 200 tons of coal, mostly anthracite, were partially destroyed. The cause of the fire is unknown.

Philadelphia, Penn.—The Eastern Coal Dock Co., recently awarded a contract to the Belmont Iron Works for a one-story steel machine shop to be erected on the east side of Delaware Ave. south of Porter St. The cost will be approximately \$1275.

Toledo, Ohio.—Railroad companies are warning coal shippers of the necessity for shipping as early as possible in order to avoid a car shortage later. Indications are that

traffic will be heavy during the fall and that the car supply will be taxed to its utmost.

Wheeling, W. Va.—It is reported that a \$250,000 coal land deal has been made in Belmont County and that the Huffman & Rice interests of Waynesburg, Penn., are the purchasers. The coal land is reported to have been sold at an average price of approximately \$30 per acre.

Bedford, Ind.—Fire recently destroyed the coal chutes of the Monon R.R., together with a large quantity of coal and two steel and two wooden coal cars. The loss of the chutes alone was \$2500, wholly covered by insurance, the total loss reaching \$8000. The origin of the fire is unknown.

Pittsburgh, Penn.—The Epping-Carpenter Pump Co. has recently placed contracts for doubling the capacity of its extensive foundry. One of this company's recent orders is for a compound pot-valve wood lined pump for the H. C. Frick Coke Co. This pump is built to handle 3500 gal. of water per minute.

Washington, D. C.—An American consular officer in France has transmitted the name of a large manufacturer of creosote oil and similar products, who desires to get in communication with American manufacturers of pitch for coal briquettes and who is willing and able to maintain a permanent export trade in this line.

Harrisburg, Penn.—The Hamburg Vitriified Brick Co. of Hamburg has complained to the Pennsylvania State Railroad Commission that the Reading Railroad Co. has a rate of 90 cents a ton on coal from Landingville and Auburn to Hamburg where the Pennsylvania Railroad Co. charges but 50 cents for practically the same haul.

Rio de Janeiro, Brazil.—The American consul general at Rio de Janeiro reports that the Estrada de Ferro Central do Brazil, the largest Brazilian government railway, has purchased 40,000 tons of American coal by tender through a local firm and it is reported that a steamship company will use 20,000 tons of American coal to bunker steamers calling at this port.

New Orleans, La.—Owing to the closing of the government locks in the Tombigbee River for slight repairs, the opening of the regular coal carrying barge service to the Alabama fields has been delayed. Two more power barges for this trade are nearing completion. Each is fitted with two 150-hp. gas-driven engines, and a small 7-hp. auxiliary engine for starting. The gas producer is of the improved type, generating the gas only as needed.

Detroit, Mich.—The southern division of the Detroit, Toledo and Ironton R.R. was sold at public auction at Delray by E. S. Vorheis recently. Otto T. Bannard and M. M. Buckner acted on behalf of the purchasing committee and bought the road for \$1,650,000. The Ohio division of the same road was recently sold at Springfield to parties said to represent the first-mortgage bond holders. The bonded indebtedness of the road amounts to about \$14,000,000.

Pittsburgh, Penn.—The sanitation of mines and mining camps throughout the United States is to be made the subject of an exhaustive study by the U. S. Bureau of Mines, and the first work in this direction is to be done from the different stations. J. H. White has been placed in charge of this new department and has become identified with the general offices of the Bureau of Mines here. For years he was with the Tennessee Coal & Iron Co. and has made sanitation a specialty.

Hazleton, Penn.—A. Pardee & Co., operators of the Cranberry and Crystal Ridge collieries, which employ about 1000 hands, locked out their employees on July 5. There had been strike talk among the men for the previous two weeks and the mines are now at a standstill.

Nearly 3000 mine workers are on strike in the Hazleton regions. At Audenreid No. 4 colliery of the Lehigh and Wilkes-Barre Coal Co. the breaker boys struck over dissatisfaction due to wages, tying up the whole colliery. The breaker boys at the Black Ridge mine of the Hazle Mountain Coal Co. have also gone on strike on account of a cut in their wages.

Pittsburgh, Penn.—A receiver for the Monongahela River Consolidated Coal & Coke Co., a \$30,000,000 corporation, has been asked for by Alexander Dempser, its former president, in a bill in equity, filed in Common Pleas Court, June 30, against the Monongahela River Co., the Pittsburgh Coal Co. of New Jersey, the Pittsburgh Coal Co. of Pennsylvania and the Union Trust Co. of Pittsburgh, trustee. The Court is also asked to set aside an election of directors for the Monongahela Co., held last January, and to grant an injunction restraining the Pittsburgh Coal Co. of New Jersey from controlling the Monongahela River Co. Dempster is the only individual holding Monongahela River Coal & Coke Co. stock.

COAL TRADE REVIEWS

GENERAL REVIEW

The most interesting development in the national hard coal market for some time was the recent announcement of the new Pennsylvania state tax on anthracite. What the effects of this will be are problematical. The operators have, of course, been forced to shift the burden onto the public, and whether the outside states will object to sharing a portion of the Pennsylvania taxation remains to be seen. Aside from this, the trade is quiet and moderately dull, but there is a fair amount of business on hand for July.

The Eastern bituminous market has weakened slightly, under the influence of the strike settlement in the New River field. It is now easy to buy at circular prices, in the New England states, but on the other hand there is no shading and quotations are being firmly maintained; there is some slight tendency to sag on the lower grades only. It is believed by some that the soft coal market will ease off into the customary summer dullness, but on the other hand the West Virginia trouble was not of sufficient proportions to have materially affected the situation in any event. Buyers who expected to obtain their coal cheap through the summer are still being disappointed, there being little prompt tonnage available, even in the lower grades.

Mines in the Pittsburgh district are still operating up to a high rate, the demand on contract continuing heavy and a fair amount of business being done in the prompt market. There does not seem to be any possibility of a slump, while on the other hand there are good prospects for a further advance, should there be the slightest provocation for same. Many producers are refusing absolutely to enter into further contracts.

In Ohio, the only disturbing feature is the car shortage, which is tending to curtail production; the output last week was also restricted by the holiday. Most of the producers have announced an advance of ten cents in the circular and there is an increased domestic demand for stocking, while the lake movement to the Northwest is still heavy. Tonnage at the Hampton Roads piers has accumulated fast and vessels are compelled to wait almost indefinitely for cargoes; some high spot prices are being paid at rare intervals, in order to clear vessels. In fact, the demand there has seldom ever been so heavy. Shipments from the Pocahontas field are about normal but there has been a heavy decrease from the New River district; men are returning to work in this latter field, but it will be some time before the full production is restored.

Requests for future shipments in the Middle West are now generally being refused by operators, who fear that they are not going to have sufficient coal in the fall. While the market generally is showing a tendency to tighten somewhat, the situation is in some respects uncertain. Indications generally are for an improvement, but buyers claim that the dealers are all overbought and the operators oversold. The opening of the big Keokuk Dam has displaced a large tonnage of Middle Western steam coal.

BOSTON, MASS.

Bituminous—All anxiety over labor troubles in Pocahontas and New River is now apparently a thing of the past. While a suspension was effective through most parts of the New River field July 1, yet all the reports were coupled with assurances that the operators would grant concessions enough to make any prolonged strike unlikely. It is now expected that the threatened "flurry" will slope off into a spell of midsummer dullness such as this market usually goes through at this season.

Mining of anything like the normal output will hardly begin, however, until about July 10 or 15, and meanwhile the loading at Hampton Roads will be slow. Tonnage accumulated fast the last fortnight and at this writing not only barges and sailing vessels but steamers as well have been detained three and four times as long as usual. For spot coal, high prices are still being paid to clear vessels but the volume of such business is small and now with the absence of strike talk it will probably amount to little, if indeed there is any at all. There is still a quantity of coal to be bought in New England and the outlook is that for a month or so anyway it will be easy from the buyer's standpoint

to cover on Southern coals on the \$2.85 f.o.b. basis. The contract figure is expected to be firmly maintained, however, and the New England trade is pretty sure to be steady the balance of the season.

On Georges Creek and the Pennsylvania grades there is little that is new. The better coals from Somerset and Cambria Counties are holding strong in price but inferior grades have sagged off a little. Just as a broader market was opening for Pennsylvania coals and the trade was getting to the point of buying with not so much regard to quality the news came from New River and the demand from this territory has swung back to more nearly normal. The market all-rail is without special change. Sales agents have been cautious about selling ahead, but they have taken care of current business at not more than 5@10c. over the figures set for yearly contracts. Just at present it is a kind of mark-time situation.

Anthracite—The big news this week is the announced intention of the anthracite companies to charge on their invoices the Pennsylvania state tax of 2½% of the market value of coal at the mines under the law which went into effect June 27, and so make dealers, and ultimately the consumer, pay the tax beginning July 1. It amounts to an extra advance in July of 8¼c. on stove and egg and 9c. plus on chestnut and it remains to be seen how it will be received by the trade. Meanwhile there is ample business in sight for July and unless there are still other unusual features the market is likely to maintain its present condition throughout the month. Stove size seems in a little better supply than earlier in the season.

Current wholesale prices on bituminous run about as follows:

	Clearfields	Cambria Somerset	Georges Creek	Pocahontas New River
Mines*	\$1.05@1.45	\$1.35@1.65	\$1.67@1.77	
Philadelphia*	2.30@2.70	2.60@2.90	2.92@3.02	
New York*	2.60@3.00	2.90@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.85@3.00
Providence†				3.90@4.00
Boston†				4.00@4.15

*F.o.b. †On cars.

NEW YORK

Bituminous—The holiday toward the close of last week caused a suspension of about two days at the mines, some operations even being affected for the last three working days of the week. As a result, there has been a further tightening in the soft-coal market, although it is temporary in this case and will probably be relieved shortly.

Stocks at tidewater continues about normal, the same as they have been for some time. Occasional contracts are still being made; it has been difficult to convince many of the consumers, who refused flatly to concede the increased quotations demanded by the operators, that such was justified.

It is doubtful if the labor agreement in the New River Field will have any effect on the local situation. The trouble has not become of sufficient proportions to be felt in the market, and because of the labor scarcity it will be some time before the production becomes very large. The car supply on the Pennsylvania R.R. is still short, while that on the New York Central likewise continues good. We continue to quote the New York soft-coal market unchanged on the following basis:

West Virginia steam, \$2.55@2.60; fair grades of Pennsylvania, \$2.65@2.70; good grades of Pennsylvania, \$2.75@2.80; best Miller Pennsylvania, \$3.05@3.15; George's Creek, \$3.25@3.30.

Anthracite—The most interesting feature in the hard-coal market during the week was the announcement of a 2½ per cent. state tax on all the anthracite produced in Pennsylvania, which amount, most of the leading hard-coal companies have already stated they will add to the regular circular price. The effects of the change, if any, have not developed at this writing. As usual, the burden has been shifted along until it rests on the public's shoulders, and it now remains to be seen whether outside states propose to carry a share of the Pennsylvania state tax.

While the trade generally, so far this year, has been somewhat above the average, it is now clear that the customary summer lethargy is beginning to develop. Orders are becoming scarcer so that a general restriction in production throughout the mining regions is taking place. None of the sizes can be said to be in particular demand, but stove coal approaches this condition the nearest.

The market promises to be quiet from now on through the remainder of the summer, but indications point to a heavy demand the coming fall. We quote the New York market on the following basis:

	Circular	Lehigh	Individual Scranton	Schuylkill
Broken.....	\$5.00	\$4.45@4.65	\$4.50@4.70	\$4.45@4.65
Egg.....	5.25	4.80@4.90	4.85@4.95	4.80@4.90
Stove.....	5.25	4.90	4.95	4.90
Chestnut.....	5.50	5.05@5.15	5.10@5.20	5.05@5.15
Pea.....	3.50	3.25@3.45	3.30@3.50	3.25@3.45
Buckwheat.....	2.75	2.10@2.45	2.50@2.75	2.10@2.45
Rice.....	2.25	1.75@1.95	2.25	1.75@1.95
Barley.....	1.75	1.30@1.70	1.75	1.30@1.70

PHILADELPHIA, PENN.

The anthracite coal trade in this vicinity is commencing to show marked signs of the summer influence. The dealers are not only bemoaning the lack of trade, but are also confronted with an additional problem in the shape of the new state tax, which imposes a levy of 2½% on the market value of the coal at the mines. This will undoubtedly be saddled on the consumer. There have been considerable comments on this act, and the majority of the Pennsylvania press seem to feel that it is uncalled for as well as unjust. The operators generally are handling the tax in a way of their own, that is, by adding it as a separate item to the invoices for the coal, simply passing the charge that will be imposed upon them on to the dealers, who will undoubtedly add it on to the retail price.

Beginning the first full week of July, it is understood that many of the large operators will commence curtailing operations. While up to the present time the market has been absorbing practically all of the prepared sizes, the outlook now is such that it was probably deemed advisable to institute partial suspensions. The work at the mines will probably be limited to four days a week, which it is felt will be sufficient to meet the requirements of the trade for the next two months or longer.

Outside of stove, there is no active demand for any particular size. Individual operators are now offering their output of egg and chestnut at considerably less than the so-called circular prices and the steam sizes are a drag in the market, the only movement being on contracts already entered. The Tidewater business to the New England market still continues in a fairly active condition, but the demand from this direction is slowly but surely growing less as the summer season advances.

Encouraging reports still continue to emanate from the bituminous market. Conditions in the West and Northwest have resulted in a marked strengthening of this branch of the trade, and a stiffening in prices. Contractors who are still holding out for better figures are buying on the open market now for their current needs at advances over the figures at which they could have secured their season's supply. Altogether the trade looks good from this standpoint, and confirms the prediction made months ago, that the summer would see a much improved condition of affairs as far as bituminous is concerned, and indications are that it will continue so until the fall demand opens up.

PITTSBURGH, PENN.

Bituminous—There is no material change in the situation. Mines continue to operate at a high rate, barring last week's interruption through the holiday, while demand is good on contract, and there is a fair demand for prompt lots. Some additional contracts for coal have been made, for delivery up to Apr. 1. Despite the fact that slack always sells off in the summer, some of these contracts have been for slack at the full price of 90c., which prevails without question outside the lake-shipping season. There is little of this grade offered at special prices, except that on the Pan Handle there are a few operators selling prompt at 70@75c. in small lots. We quote regular prices as follows, with premiums sometimes paid on prompt lots: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30; ¾-in., \$1.40; 1¼-in., steam, \$1.50; 1¼-in. domestic, \$1.55 per ton at mine, Pittsburgh district.

Connellsville Coke—The operators have traversed most of the distance, apparently toward winning the long contest for \$2.50 for furnace coke for second half. Buyers having contracts expiring June 30, involving about 175,000 tons a month, continued to hold aloof until within the past few days when operators sold for July only at the \$2.50 price, to

the extent of about 90,000 tons; by far the major part of this tonnage was sold by a group of operators who had definitely announced their adherence to a \$2.50 price. Last Saturday there was urgent inquiry for spot-furnace coke, and some buyers seemed ready to pay up to \$3, but little was secured. Afterward they changed their attitude and declared they would run their furnaces slow, or bank altogether, rather than pay a fancy price. This week the market is extremely quiet on the surface, there being practically no inquiry. Consumers not yet covered are probably conferring together and hoping to break the market by keeping out entirely. The operators, on the other hand, consider their contest practically won, and expect the remaining consumers eventually to come into the market and pay \$2.50. Most of the sales made for July were guaranteed against the sellers' declines, which, instead of proving a weakness seems to have strengthened the operators' position. Production last week was light on account of the holiday, practically two days being lost, and coke shipments are light. We quote: Prompt furnace, \$2.50; contract furnace, \$2.50; prompt foundry, \$2.75@3; contract foundry, \$2.75@3, per ton at ovens.

BALTIMORE, MD.

With no possibilities now of a strike in West Virginia, the trade has settled down to a summer basis, but considerably better than a year ago, when contracts were being made at from 10c. to 25c. off what is demanded at present. Except for slack, which has recently taken another slump down to around 55@60c., very little coal, even of the least desirable grades, can be had on a mine basis of less than 90@95 cents.

While there is now no rush for fuel, there is enough demand to continue a healthy warm-weather market. Quite a number of small manufactories throughout the state that have been purchasing in the open market have recently come under cover for either short- or long-term contracts. Many concerns that had hoped to go through the summer buying at the low figures which prevailed for spot fuels last summer, have been sadly disappointed, and are now contracting at less advantage than if they had done so early in the spring.

The coal record at this port the month of June was rather remarkable, 25 large steamships being loaded in the export trade. The tonnage ran to 110,000 tons, an increase of approximately 22,000 over the previous month, and the largest single month in the history of the port.

The first of July ushered in a real dull period for the anthracite dealers. During April, May and June the low circular resulted in considerable purchasing for delivery during that time. The rail movement both from the anthracite and bituminous fields has been good; while there has been some spasmodic complaint from some regions, especially in the West Virginia gas-coal districts for movement to the Northwest, the main situation has been easy.

BUFFALO, N. Y.

The bituminous coal market has seldom ever been as active at the end of June as this year, and all members of the trade are searching for a reason to expect a falling off before long. On the contrary, however, all indications point to a still stronger market by September, and perhaps sooner; the reason for this is that the consumption is so heavy, while the production cannot possibly be urged to a higher point. Operators and shippers are doing their utmost to get more coal, but the miners are indifferent. They are not very numerous and do not care to work full time during this period of the year.

It is said that there is not a car anywhere in the country under demurrage if the holder is at all up to his business; equipment is none too plenty, and it is felt that with a little larger output the supply would run short. If crops are as large as they promise to be, and the consumption holds up the outlook for the fall is serious. For this reason there is a general refusal on the part of sellers to make any more contracts unless they can get full going prices, and some of them do not dare to contract even on that basis.

There is every prospect of a further advance in bituminous prices as soon as the smallest farther reason for it appears. Some shippers are calling present figures too low, but the trade generally is satisfied with \$2.90 for Pittsburgh select lump, \$2.75 for three-quarter, \$2.65 for mine-run and \$2.15 for slack, although the latter is hardly as strong as the sizes. Allegheny Valley prices are strong at about 25c. lower than Pittsburgh. There is no stir in coke, as consumers still think it too high for the rest of the market. Quotations are \$4.75 for best Connellsville foundry.

Anthracite is quiet except with the jobber with independent mines behind him. He is always on the watch to make sure that they do not get away from him, as they have done

in former years. There is not much danger of it now, for the consumer is not going to buy much till cool weather is here with a reminder of the return of winter. At the same time the lake shippers are making every effort to crowd coal Westward. Shipments by lake for the week were 136,000 tons, the total for June being 642,110 tons and for the season, 1,785,574 tons. With the late start last season, on account of mining suspension, the amount was only 551,693 tons to July 1.

COLUMBUS, OHIO

The interposition of a holiday on Friday of last week, which was followed by a partial holiday on Saturday, curtailed production in all of the mining districts of the state. But notwithstanding that fact the output has been good and the tone of the market satisfactory in every respect. All mining concerns announced new circulars for July 1 which makes an advance of about 10c. per ton.

One of the best factors of the trade is the activity displayed in domestic grades. Retailers are placing orders both for immediate delivery and shipment later in the month. They believe that the stocking up period will arrive sooner than usual and want to be prepared for the demand when it appears. Dealers stocks are not heavy in any territory tributary to Ohio and the approach of the threshing season also has a stimulating effect upon the trade. The docks of the Northwest are taking the coal as fast as it comes to them and no congestion of consequence is reported. Boats are still being chartered for the latter part of the season.

Production in Ohio fields was interfered with by the two holidays of the week and also by a growing car shortage, particularly in eastern Ohio. Notwithstanding these conditions the output in the Hocking Valley is estimated at 85 per cent. of the average and in the Pomeroy Bend field about 75 per cent. In eastern Ohio the output is about 70 per cent. of the average, considerable trouble from lack of cars being reported from this latter district.

Iron and steel plants are taking a good tonnage despite the usual dullness which overtakes manufacturing during the summer months. Factories show no disposition to stock up to guard against a shortage but this will probably come later in the season. The only disturbing factor noted by coal men is the possibility of a car shortage which is expected to be more acute this year than ever before.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburgh	Pomeroy	Kanawha
Domestic lump.....	\$1.60		\$1.60	\$1.60
3 inch.....	1.45	\$1.20	1.40	1.40
Nut.....	1.25		1.35	
Mine-run.....	1.25	1.10	1.15	1.20
Nut, pea and slack.....	0.65		0.65	0.65
Coarse slack.....	0.55	0.65	0.50	0.55

TOLEDO, OHIO

The coal business in Toledo is unusually strong for this season of the year. Lake shipping began early and would have been still sooner but for a shortage of coal at the docks due to the fact that so much was required to make up the deficit caused by the Ohio floods.

The present season gives every evidence of proving a banner year in coal shipments, but the next one will be even much better for the Toledo docks. The new \$2,000,000 Hocking Valley docks will be completed and open for use next June and Toledo will hold the enviable position of being the first port in the world so far as coal and ore is concerned, being equipped with more loading machinery than any port on the lakes. The enormous Lake Shore track and yard improvements being made here at an expense of \$3,000,000 will also have considerable effect on the coal market. The lake this season is considerably higher than usual, which is, of course, of benefit to coal and ore shippers and will result in much heavier loading than is possible when the water is lower.

The coal movement, according to the figures at the Customs office here, show that the shipments at this port for this season amount to 2,165,802 tons as against 1,762,139 tons for the same period in 1912, an increase of 403,653 tons. The general demand for coal has been extraordinary throughout the season and is strong from every source for both steam and domestic fuels. The call is coming from all sections of the state and orders for present and thirty-day delivery are coming in freely. The traffic situation here is highly satisfactory thus far and no congestion has been noted. Prices have been holding firm and there have been no concessions from the list. Quotations on the local market follow:

	Poca- hontas	Hock- ing	Jack- son	Pome- roy	Mass- ilon	Pitts- burg	Cam- bridge
Domestic lump....	\$2.25	\$1.50	\$2.50	\$1.75	\$2.50	\$1.35	\$1.35
Egg.....	2.25		2.50	1.50	2.50		
Nut.....	1.80	1.15	2.25	1.50	2.50		
3/4 lump.....		1.35				1.20	1.20
Mine-run.....	1.50	1.15				1.10	1.10
Slack.....		0.45				0.65	

HAMPTON ROADS, VA.

While the dumpings at Hampton Roads during the week have been fairly good as a whole, Lamberts Point alone has probably handled more coal than both Sewalls Point and Newport News. The demand has seldom ever been so heavy at this port while shipments are only about normal from the Pocahontas District with a considerable decrease in the output from the New River fields. The strikes in the latter district are causing considerable uneasiness among buyers and shippers and while it is reported that the men were to return to work about July 7, it will take some time to get a normal quantity of coal to tidewater.

Considerable tonnage is in the stream at Sewalls Point awaiting coal and vessels are experiencing some delay at Newport News as well. There is also a large fleet anchored off Lamberts Point; some of the boats are awaiting turn at the docks and others are short of cargo. Suppliers are practically all short of coal but such few as have any on hand will not quote a price as they are holding off to take care of contract vessels which are expected at any moment.

Coal shipments over Hampton Roads piers for the month of June were heavy although they did not come up to the dumpings for May. During June there was dumped over the Lamberts Point piers 476,122 tons, at Sewalls Point 254,758 and at Newport News piers 263,231 tons, a total of 994,111 tons.

LOUISVILLE, KY.

The long continued spell of hot weather appears to be having a depressing effect upon the coal market. Campaigning for orders for the winter business should now be well under way, but the unusually warm weather has taken all the snap out of the trade, and it is difficult to do business. The holidays over the Fourth of July did not have any effect on the situation, as producers were more than willing to close down, because of the difficulty in disposing of tonnages.

The orders for screenings still continue light, with production far in excess of the demand; steam consumption generally throughout the state is light. The circular prices for July delivery are being maintained, with only occasional discounts being offered on screenings at some of the large distributing centers; these are for the most part being well maintained in spite of the over-supply.

INDIANAPOLIS, IND.

Local dealers have increased anthracite prices 25c. a ton, and Pocahontas 50c., the former following the various smaller monthly advances made at the mines. One of the largest retailers says it is the first time for many years that he has not been able to name prices for coal to be delivered to his customers in the fall. Dealers can get some spot-shipment coal from the smokeless field but cannot make any contracts for deferred shipment. Under such circumstances they are not able to say what future quotations on Pocahontas will be or whether they will have much coal on hand when the winter buying opens in the fall. In Indiana and other states conditions and prices have not changed.

DETROIT, MICH.

Bituminous—Business in this vicinity continues good for this period of the year, especially on domestic coal there being plenty of orders for the current month, and some being placed ahead into August; Pocahontas is particularly strong. Most of the local dealers appear to be well sold up on this latter coal, and there are rumors that some have received more than the regular circular price. The Lake movement remains active, and there is some indication of a car shortage, although it has not reached serious proportions as yet. The local soft coal market is quotable on about the following basis:

	W. Va. Splint	Gas	Hock- ing	Cam- bridge	No. 8 Ohio	Poca- hontas	Jackson Hill
Domestic lump.....	\$1.60	.....	.....	.....	.....	\$2.00	\$2.00
Egg.....	1.60	.....	.....	.....	.....	2.00	2.00
Steam lump.....	1.50	.....	.....	.....	.....	.....	.....
3-in. lump.....	1.25	\$1.25	\$1.10	\$1.15	\$1.10	.....	.....
Mine-run.....	1.10	1.10	1.10	1.10	0.90	1.50	.....
Slack.....	0.85	0.85	0.45	0.50	0.60	.....	.....

CHICAGO

The Chicago market has been influenced by the possibility of a general strike in the West Virginia district and as a result there was a shortage in smokeless coal. At the start of the coal year efforts were made to place the price of this fuel at \$4.25 but during last week, some of the more prominent dealers fixed the spot price for wagon delivery at \$4.60.

The jobbing interests claim that instead of an increase in price there will be a decrease because operators are over-sold and consumers over-bought. They back these statements up

with the fact that shipments to the lake districts are 25 per cent. above what they usually are at this period. The market is said to be tightening up slightly on other grades of coal owing to heavier harvest and mid-summer storage buying but prices remain the same. Anthracite seems to be now taking the place of smokeless owing to the shortage of the latter. The situation is just the reverse of what it was last year. Prevailing prices are:

	Springfield	Franklin Co.	Clinton	W. Va.
Domestic lump.....	\$1.97@2.07	\$2.55	\$2.27	
Egg.....		2.55		\$3.94@4.20
Steam lump.....	1.82@1.87		2.07	
Mine-run.....	1.77@1.82	\$2.20@2.30	1.87	3.30
Screenings.....	1.62@1.67	1.90@1.95	\$1.62@1.67	

Coke—Connellsville and Wise County, \$5.25@5.50; byproduct egg and stove, \$4.85; byproduct nut, \$4.75@4.85; gas house, \$4.50@4.60.

ST. LOUIS, MO.

There is no change in market conditions so far this month, although indications a few weeks ago were that the first of the month would see a general increase in prices; however, this is bound to come within the next week or two on the Standard coals and possibly on Carterville. Standard is still being sold below the cost of production, and on the first of the month St. Louis received the first electricity from the Keokuk Dam. It is estimated that this has, up to the present time, already displaced between fifty and seventy-five cars per day of screenings, which have been used at the different power houses of the United Railways Co. and the Union Electric Light & Power Company.

Coke still remains firm with indications of a slight advance and a fairly good demand.

The prevailing circular is:

	Carterville and Franklin Co.	Big Muddy	Mt. Olive	Standard
2-in. lump.....				\$0.80
3-in. lump.....				
6-in. lump.....	\$1.15 @ 1.30			0.90
Lump and egg.....		\$2.10	\$1.30	
No. 1 nut.....	1.15 @ 1.30		1.15	0.90
Screenings.....	0.85 @ 0.90			0.80
Mine-run.....	1.05 @ 1.15			0.75
No. 1 washed nut.....	1.50			
No. 2 washed nut.....	1.35			
No. 3 washed nut.....	1.30			
No. 4 washed nut.....	1.20			
No. 5 washed nut.....	1.00			

St. Louis prices on July anthracite are: Chestnut, \$7.25; stove and egg, \$7; grate, \$6.75; smokeless lump and egg are \$4.65; byproduct coke, \$5.10, and gas-house coke, \$4.85.

PRODUCTION AND TRANSPORTATION STATISTICS

VIRGINIAN RAILWAY

Total shipments of coal over this road for May of the current year were 318,720 tons as compared with 311,247 tons for the same month last year. For the five months to May 31 of the current year, the shipments were 1,897,003 tons as compared with 1,406,847 tons for the same period last year.

IMPORTS AND EXPORTS

The following is a preliminary statement of the coal imports and exports in the United States for May and the eleven months ending May 31.

Imports—Bituminous imports for May of the current year were 97,993 tons as compared with 132,959 tons for the same month last year. For the eleven months ending May 31 of the current year, bituminous imports were 1,487,498 tons as compared with 1,167,147 tons for the same month last year, and 1,685,049 tons during 1911.

Exports—Exports for May of the current year were 2,409,215 tons as compared with 1,504,233 tons for the same month last year. For the eleven months ending May 31, total exports of coal for the current year were 18,396,346 tons as compared with 16,026,491 tons for the same period last year and 13,333,726 tons in 1911.

COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during April and the first

four months of this year in comparison to last year, in short tons:

Classes and Railroads	April		4 Months Ending April	
	1912	1913	1912	1913
Anthracite:				
B. & O. (a).....	10,902	123,602	582,656	557,994
C. & O. (a).....	3,215	2,176	14,442	4,343
Erie (c).....	122,725	753,072	2,302,666	2,711,120
Penna. (a-c).....	290,865	930,592	3,579,602	3,674,096
Virginia (a-b).....		45		356
Total 5 roads.....	427,707	1,809,467	6,479,366	6,947,909
Bituminous:				
B. & O. (a).....	2,297,135	2,660,702	11,058,713	11,191,866
B. R. & P. (a-b).....	401,581	661,519	2,701,410	2,955,146
B. & Susq. (a-b).....	22,269	152,537	490,368	602,601
C. & O. (a).....	1,609,054	964,104	5,915,640	4,925,334
Erie (c).....	20,988	70,970	134,325	255,822
H. & BTM (a-b).....	99,953	93,376	502,023	474,976
N. Y. C. & H. R. (a-b).....	443,327	675,175	2,835,523	3,119,160
N. & W. (a-b).....	1,863,555	1,543,220	7,121,563	7,237,796
Penna. (a-c).....	3,291,985	3,796,432	15,461,920	15,914,179
P. & L. E. (a-b).....	214,665	1,133,744	3,090,960	4,043,395
P. S. & N. (a-b).....	55,020	227,003	618,792	908,985
Virginia (a-b).....	280,995	345,039	1,184,961	1,578,283
W. Md.....	254,591	245,564	977,366	1,006,549
Total 13 roads.....	10,855,138	12,569,385	52,093,562	54,214,112
Coke:				
B. & O. (a).....	390,228	400,317	1,470,655	1,286,512
B. R. & P. (a-b).....	20,500	45,436	133,978	209,443
B. & Susq. (a-b).....	115	26,448	82,086	104,211
C. & O. (a).....	19,992	28,471	79,943	121,085
N. Y. C. & H. R. (a-b).....	6,396	7,723	29,644	25,152
N. & W. (a-b).....	116,345	129,625	535,066	578,453
Penna. (a-c).....	1,079,046	1,230,979	4,190,832	4,987,304
P. & L. E. (a-b).....	507,858	594,863	1,996,288	2,454,710
P. S. & N. (a-b).....	338	91	5,155	9,333
W. Md.....	5,704	7,865	24,987	26,903
Total 10 roads.....	2,146,522	2,471,818	8,548,634	9,803,156
Total Coal and Coke 13 roads:				
January.....			16,421,839	18,936,646
February.....			17,787,331	17,546,496
March.....			19,483,025	17,631,345
April.....			13,429,367	16,850,690

(a) Includes coal from connecting lines. (b) Includes Company's coal. (c) Does not include company coal hauled free. * Includes company coal for fueling.

FOREIGN MARKETS

GREAT BRITAIN

June 27—The demand for all kinds of coal is more active, and prices have a firmer tendency.

Quotations are as follows:

Best Welsh steam.....	\$4.68@4.92	Best Monmouthshires.....	\$4.20@4.26
Best seconds.....	4.44@4.56	Seconds.....	4.03@4.14
Seconds.....	4.20@4.32	Best Cardiff smalls.....	2.52@2.58
Best dry coals.....	4.44@4.56	Seconds.....	2.28@2.40

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

The "Iron and Coal Trades Review" makes the following statement in its editorial columns under date of June 13:

There can be no doubt that the demand for coal has been taxing the resources of the principal producing countries of the world, with the exception, perhaps, of the United States, and the result has been a general advance in prices. In the United Kingdom many circumstances have combined to accentuate this movement, including the new burdens of industrial legislation which have to be borne by the coal-mining industry, increased wages, the irregular working of the miners, difficulties in Wales over the non-Unionist question, and the strikes in Belgium and Silesia. Average f.o.b. prices at British ports are now more than 25c. per ton higher than they were a year ago, and in the inland market collieries are asking advances of from 25c. to 50c. per ton on all contract renewals, according to the class and quality of coal in question. As compared with 1911, a minimum advance of 75c. per ton is being obtained, and in many cases it is considerably more.

SPANISH IMPORTS

Coal imports into Spain for the four months to Apr. 30 of the current year were 949,199 metric tons, as compared with 664,733 tons for the same period last year. Coke imports for this period of the current year were 125,304 tons as compared with 137,150 tons for the same period last year.

GERMANY

Coal production of the German Empire for the first four months of this year and last year was as follows:

	1912	1913
Coal.....	56,083,431	63,379,455
Lignite.....	26,769,972	28,176,021
Coke.....	9,061,330	10,660,315
Coal briquettes.....	1,629,265	1,937,511
Lignite briquettes.....	6,226,447	6,866,452

FINANCIAL DEPARTMENT

The Elk Horn Fuel Co.

The newly organized Elk Horn Fuel Co. has issued the following statement concerning the 5%, 5-year convertible gold notes they are now offering:

The issue of these notes is limited to \$4,000,000. They are dated May 1, 1913, mature May 1, 1918, but are subject to redemption at the option of the company (in whole, or in part by lot) on any interest day upon sixty days' notice at 105 and accrued interest. The notes are in denominations of \$1000 and \$500, may be registered as to principal, and are in coupon form with interest payable May 1 and Nov. 1.

Both principal and interest are payable at the office of the Guaranty Trust Co. of New York, without any deduction for any tax or taxes which the company may be required to pay thereon or deduct therefrom; the 0.004 state tax in Pennsylvania will be refunded as provided in the mortgage. At the option of the holder, the notes may be converted at their face value at any time after Nov. 1, 1913, and until Feb. 1, 1918; or if before the latter date they are called for redemption, then up to and including the thirtieth day preceding the date fixed for redemption (but in no event after Feb. 1, 1918) into shares of the capital stock of the Consolidation Coal Co. at \$105 per share of \$100 par value, with a cash adjustment for fractional shares and of interest and dividends.

Organization and Capitalization—The Elk Horn Fuel Co. is incorporated under the laws of the state of West Virginia, and is capitalized as follows:

5% cumulative preferred stock.....	\$7,000,000
Common stock	19,000,000
First mortgage 5-year 5% convertible notes (closed issue)	4,000,000
Total	\$30,000,000

all of which are outstanding.

The books of the company show a surplus of over \$1,000,000 applicable to the payment of interest and dividends, of which over \$500,000 is in cash.

Property and Security—The notes are a direct obligation of the company and are secured by a mortgage dated May 1, 1913, to the Guaranty Trust Co. of New York, which is a first lien on the following properties and on all property hereafter acquired by the Elk Horn Fuel Co., subject, however, to purchase money liens thereon:

(a) Direct first mortgage on 199,479.09 acres of land, in fee, and mineral rights of which 184,829.09 acres are in the Elkhorn region in eastern Kentucky, practically all of which lies in what is known as "The Elkhorn Coking Coal Field"; and 14,650 acres in Randolph and Upshur Counties, West Virginia (known as the Rich Mountain properties), now under operation.

(b) Upon 15,758 shares of the capital stock of the Beaver Creek Consolidated Coal Co., out of a total authorized and outstanding issue of 55,150 shares. This company owns, free from all liens and encumbrances, approximately 50,000 acres of land in fee or mineral and mineral rights, in "The Elkhorn Coking Coal Field." These lands and mineral rights are subject to an option in favor of the Elk Horn Fuel Co., under the terms of which the latter has the right to purchase all of these lands and mining rights at \$60 per acre, at any time prior to Apr. 30, 1918, free of taxes or other expenses in the meantime.

(c) Upon 12,000 shares, being the entire issue of the capital stock of the Mineral Fuel Co., owning 4500 acres in "The Elkhorn Coking Coal Field." This company has an outstanding bond issue of \$1,200,000, of which \$800,000, or the proceeds thereof, are reserved for development purposes upon its property; this is an operating company.

(d) Forty-four thousand shares of the par value of \$4,400,000 stock of the Consolidation Coal Co., at present market value of about \$4,400,000, paying dividends at the rate of 6% per annum.

In addition to the foregoing properties, which are subject to the mortgage, the Elk Horn Fuel Co. also owns 1800 shares of a total outstanding issue of 1936 shares of the Tennis Coal Co., which owns approximately 49,200 acres of land in fee or mineral and mineral rights in the counties of Leslie, Perry, Harlan and Knott, Kentucky; these lands represent a market value of over \$700,000.

Revenue—The income of the company for the first year of its operation is estimated at \$303,000. This includes \$264,000 dividends at the rate of 6% per annum on Consolidation Coal Co. stock, pledged as part security for the notes, and in addition earnings which will accrue to this company from the Mineral Fuel Co., the Rich Mountain properties, and certain leases now in force upon other properties of the company subject to the mortgage.

Except as to the property of the Mineral Fuel Co., which will be operated by it the present plan of the Elk Horn Fuel Co. is to lease its property to reputable lessees, instead of operating itself; thus obviating the necessity of providing for large capital expenditures, which direct operation by the company itself would entail. Applications are already in hand, and negotiations in progress for leases, on terms advantageous to the company, and as railway construction is now under way, no difficulty will be encountered in securing leases upon satisfactory terms and profitable basis.

There will be procured for the Elk Horn Fuel Co., leases to responsible operators, satisfactory to the trustee of the mortgage, covering not less than 20,000 acres of coal land out of a total of 200,000 acres, requiring a minimum annual pro-

duction of not less than 2,000,000 net tons and a minimum royalty of 10c. per ton, beginning not later than Apr. 1, 1915; thus providing an additional income to the Elk Horn Fuel Co., from operation of not less than \$200,000 per annum from Apr. 1, 1915, to the maturity of the notes. There will, however, be considerable income from these leases during the year of 1914.

The Consolidation Coal Co.—This company is one of the largest and most important producers of bituminous coal in the United States. It owns and operates approximately 300,000 acres of coal lands in Maryland, Pennsylvania, West Virginia and Kentucky, and last year produced more than 10,000,000 tons. It is now producing at the rate of upward of 12,000,000 tons per annum, and last year earned over 10% on its outstanding \$25,000,000 of stock. The company was incorporated in 1864 and has been paying dividends for 26 years, and at the rate of 6% since 1905. It has offices and direct selling connections in New York, Boston, Portsmouth, Philadelphia, Baltimore, Washington, Cincinnati, Louisville, Detroit, Cleveland, Chicago, London and Genoa, with well established connections in Mexico and Canada.

The Consolidation Coal Co. owns a majority of the stock of Metropolitan Coal Co. of Massachusetts, which sells about a million tons of coal annually in Boston. It also owns a majority of the stock of the Northwestern Fuel Co., of Wisconsin, which company has extensive docking and handling facilities on the Great Lakes, and distributes more than three million tons of coal annually. The Consolidation company operates its own fleet of barges, tugs and steamers on the Atlantic coast, and successfully exports its coal to Europe, Africa and South America.

Management—The company is managed by men of long experience in the successful development and operation of coal properties, and its officers and directors are heavily interested in the property.

COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending July 5:

Stocks	Week's Range			Year's Range		
	High	Low	Last	High	Low	
American Coal Products.....	87	87	87	87	87	
American Coal Products Pref.....	109½	109½	109½	109½	109½	
Colorado Fuel & Iron.....	28	26½	26½	41½	24½	
Colorado Fuel & Iron Pref.....	.....	.....	155	155	150	
Consolidation Coal of Maryland.....	102½	102½	102½	102½	102½	
Lehigh Valley Coal Sales.....	200	180	190	.....	.....
Island Creek Coal Com.....	48	48½	48½	.....	.....
Island Creek Coal Pref.....	85	84	84	.....	.....
Pittsburgh Coal.....	15½	15½	15½	24½	14½	
Pittsburgh Coal Pref.....	76½	76	76½	95	73	
Pond Creek.....	16½	17	16½	23½	16½	
Reading.....	158½	156½	157½	168½	151½	
Reading 1st Pref.....	.....	.....	86	92½	86	
Reading 2nd Pref.....	86	86	86	95	84	
Virginia Iron, Coal & Coke.....	40	39	40	54	37½	
Bonds	Closing		Week's Range		Year's Range	
	Bid	Asked	or Last Sale			
Colo. F. & I. gen. s.f.g. 5s.....	93	95½	93½	June '13	93½	99½
Colo. F. & I. gen. 6s.....	.....	.....	107½	June '12	.....	.....
Col. Ind. 1st & coll. 5s. gu.....	79½	Sale	79½	79½	77½	85
Cons. Ind. Coal Me. 1st 5s.....	.....	.....	85	June '11	.....	.....
Cons. Coal 1st and ref. 5s.....	.....	92½	93	Oct. '12	.....	.....
Gr. Riv. Coal & C. 1st g 6s.....	.....	100	102½	April '06	.....	.....
K. & H. C. & C. 1st s f g 5s.....	.....	96	98	Jan. '13	98	98
Pocah. Con. Coll. 1st s f 5s.....	.....	86	86½	June '13	86	87½
St. L. Rky. Mt. & Pac. 1st 5s.....	70	73	76	June '13	76	80
Tenn. Coal gen. 5s.....	99½	100	99½	100	99½	103
Birm. Div. 1st consol. 6s.....	100	102½	101	April '13	101	103
Tenn. Div. 1st g 6s.....	100	102	102	Feb. '13	102	102
Cah. C. M. Co. 1st g 6s.....	.....	103	110	Jan. '09	.....	.....
Utah Fuel 1st g 5s.....	.....	.....	.....	.....	.....	.....
Victor Fuel 1st s f 5s.....	.....	80	80	May '13	79½	80
Va. I. Coal & Coke 1st g 5s.....	92	97	92	June '14	92	98

No Important Dividends were announced during the week.

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The Monongahela River Consolidated Coal & Coke Co.

A receivership for this company has been demanded by Ex-President Dempster, who owns 481 shares of the common stock and 100 shares of the preferred. The company's equipment is valued at \$5,000,000. It is alleged that the company consummated a contract with the United States Steel Corporation to furnish coal for a period of 25 years at less than cost and also that it sold to the H. C. Frick Co. 8500 acres of coal land at \$88.50 per acre when same was worth not less than \$1000 per acre, and in addition, threw in lands worth \$300,000.